



Blended Learning in Practice

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Contents

CONTENTS.....	2
EDITORIAL.....	3
CONTRIBUTOR PROFILES.....	5
THE ERROR CORRECTION DEBATE IN SECOND LANGUAGE WRITING: IMPLICATIONS FOR PRACTICE.....	8
MAXIMISING THE ENGAGEMENT OF CRIMINOLOGY STUDENTS IN THE VIRTUAL CLASSROOM.....	18
HOW DOES ACTIVE CONTENT CREATION AND STORYTELLING CONTRIBUTE TO STUDENT ENGAGEMENT ON A MODULE SITE?.....	35
PERSONAL TUTORING USING TECHNOLOGY: FOCUSING ON SUPPORT FOR INTERNATIONAL STUDENTS AT THE UNIVERSITY OF HERTFORDSHIRE.....	52
TEACHING CONSIDERATIONS FOR IMPLEMENTING A FLIPPED CLASSROOM APPROACH IN POSTGRADUATE STUDIES: THE CASE OF MBA.....	67
QR CODES IN ENGINEERING LABORATORIES – IMPROVING STUDENT SAFETY ENGAGEMENT.....	81
DEVELOPING INDEPENDENT LEARNERS IN MATHS USING THRESHOLD CONCEPTS: TRANSITIONING FROM A-LEVEL TO FIRST YEAR UNIVERSITY MATHS.....	91
DEVELOPING A CUSTOMER-FOCUSED APPROACH IN TEACHING LEVEL 4 / 5 GRAPHIC DESIGN STUDENTS.....	102
NEUROPHOBIA – USING PLAYFUL LEARNING AS A PEDAGOGY AND INVESTIGATING TROUBLESOME KNOWLEDGE IN THE LEVEL 5 PHYSIOTHERAPY NEUROSCIENCES CURRICULUM.....	113

Welcome to the Spring 2021 edition of our e-journal Blended Learning in Practice. In this edition we have nine research articles from participants on the Post Graduate Certificate in Learning and Teaching in Higher Education (PGCertHE) programme at the University of Hertfordshire.

In this edition:

Robert Payne investigates the error correction debate in second language writing. He critically reviews the literature in this field to identify its major trends and conclusions. Robert discusses possible implications and makes recommendations for practice to teachers of second language writing.

Loren Aliu examines the new challenges faced by both staff and students in an online environment such as: issues with surveillance, mental well-being, and the pressure staff may feel to justify university fees when students do not feel that they are getting the same university experience as they would in face-to-face learning environments.

Jimmy Pressly takes knowledge and theory from the digital marketing world and applies it to the world of teaching. He uses content creation techniques combined with online teaching approaches to design a module website for the Principles of Marketing module of 2020. This paper explores and compares how online engagement has been influenced on the module site by comparing the site analytics of the previous year to this year while also considering the mid-module feedback from students.

Jahad Hasan explores the extent to which technology can help to facilitate an effective personal tutoring framework to support international students. The article considers the potential benefits and specific considerations, which could lead to improved student retention, attainment, personal development, and employability

Christopher Nicholas uses a systematic literature review to draw conclusions on the effectiveness of the flipped classroom in postgraduate settings and provides guidance on the establishment of 'best practice' for the Master of Business Administration (MBA). He discusses the alignment of assessment and content and the role of active learning in a flipped classroom.

Christabel Tan outlines the delivery method used in the implementation of QR codes within 1st year engineering laboratories to aid basic safety training for engineering practical activities. It also discusses the potential use of QR codes in engineering laboratories to deliver on-demand information and capture training needs at the time and location that is required

Carolyn Devereux investigates ways in which teachers can develop their students to be independent learners, specifically in the discipline of mathematics, with the focus on activities for first year university students. The specific barriers to student learning that are threshold concepts of the discipline are considered. Carolyn discusses how teaching students how to recognise and work through the threshold concepts helps them to develop as independent learners as well as speeds up their learning progress.

Sahar Khajeh's article discusses the development of a multidisciplinary Project Based Learning module designed to increase the connectivity of Graphic Design and IT students' academic courses with industry. The multidisciplinary aspect of the project is intended to improve the skills of students wishing to work within a design team. A second aspect, involving real customers with different cultural backgrounds from the industry, helps to improve the student's commercial and communicational skills.

Danielle Ramsey explores the use of playful learning, introducing it into the Neurosciences 2 (NS2) module during lectures and tutorials for 2019/20. Her article evaluates their effectiveness by seeking feedback from level 5 Physiotherapy students via use of a mid-module feedback questionnaire. Danielle discusses troublesome concepts in NS2, and explores them using Decoding the Disciplines and Threshold Concepts pedagogical perspectives.



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The Error Correction Debate in Second Language Writing: Implications for Practice

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Abstract

The error correction debate in second language writing can be traced to Truscott's (1996) claim that error correction is ineffective and should be abandoned. This led to a wealth of research into the effectiveness of error correction. This article critically reviews the literature in this field in order to identify its major trends and conclusions and make recommendations for practice to teachers of second language writing. The article begins by outlining the pro- and anti-correction sides of the debate. Next, it discusses the merits of error correction from the point of view of second language acquisition theory. It then turns to empirical studies of the effectiveness of different methods of error correction. Finally, it brings together the insights of theoretical and empirical research to discuss possible implications for practice. The article concludes that the literature broadly supports error correction if it is focused and compatible with the stage of language acquisition.

Introduction

The correction of errors in students' written work is one of the most time-consuming tasks for second language teachers. It can also be demoralising and frustrating because errors in one piece of work frequently reoccur in subsequent pieces. This is often attributed to students' lack of engagement with feedback; rarely do teachers question the need for error correction. In 1996, however, John Truscott argued in a review of the literature on error correction that the practice was ineffective and should be abandoned. This prompted a wealth of research aiming to discover if the assumed correlation between error correction and learning – defined here as improvement in the ability to write accurately – does in fact stand up to criticism.

This article critically reviews the literature on error correction in order to identify its major trends and conclusions and make recommendations for practice to teachers of second language writing. The article focuses on the correction of linguistic errors, such as grammar, punctuation, spelling and word choice, rather than content or organisation. The focus is also on second language writing, as opposed to writing as a native speaker. Second language writers are more prone to errors than native speakers and, since they cannot edit by ear, must consciously recall rules to understand corrections (Carduner, 2007). Furthermore, second language courses differ from disciplines in which students produce extended pieces

of writing in that linguistic accuracy is not only tacitly important but an intended learning outcome and key assessment criterion. Because error correction is therefore of great importance to students and teachers of second languages, there is a clear need for concise, accessible recommendations about whether and how to correct errors.

The article begins by outlining the pro- and anti-correction sides of the debate. Next, it discusses the merits of error correction from the point of view of second language acquisition theory. It then turns to empirical studies of the effectiveness of different methods of error correction. Finally, it brings together the insights of theoretical and empirical research to discuss possible implications for practice.

The Cases For and Against Error Correction

Truscott (1996, 1999, 2004, 2007; see also Mohebbi & Truscott, 2021) has repeatedly asserted that error correction does not lead to learning and should be abandoned. Truscott argues that this ineffectiveness should be expected for theoretical and practical reasons. From a theoretical perspective, error correction only treats the problem of inaccuracy superficially in that it does nothing to address the process of language learning. From a practical standpoint, error correction requires teachers to spot and know how to correct errors, which is not always a given, and students may not understand corrections. Truscott's most intriguing claim is that error correction, far from being helpful, is in fact harmful. For Truscott, correction is discouraging for students and causes them to avoid using linguistically complex structures for fear of being corrected. This creates a negative attitude to learning, which hinders progress. In addition, Truscott has criticised what he perceives as a burden of proof bias in the error correction debate. This requires opponents of error correction to prove conclusively that it is ineffective, while those in favour need only cast doubt on this conclusion in order to justify the continuation of the practice.

Writing in response to Truscott's 1996 article, Ferris (1999) contends that his proposal to abandon error correction is premature and calls for more research. She argues in favour of error correction because students believe it to be important. While Ferris accepts Truscott's (1996) view that this does not prove that it is effective, she points out that not correcting errors could frustrate and demotivate students. Ferris further argues that students are less likely to be able to edit their own writing, or take seriously the need to do so, if they do not receive feedback on errors. The argument based on students' beliefs, as Truscott (1999) notes in his own reply to Ferris, is circular: teachers' use of error correction fuels students' belief in its effectiveness; therefore, teachers continue to correct. The point that error correction encourages students to take accuracy seriously, however, is more persuasive. If teachers do not signal errors to students, students could surmise that accuracy is unimportant or that their work is error-free. While correction is not the only method of emphasising the need for accuracy – teachers might, for instance, stress this in conversation with students – it is probably the method that sends the most powerful message. Even if

error correction is not directly related to learning, then, it arguably has a significant role in impressing on students the importance of accuracy.

The majority of scholars continue to argue for error correction, particularly if it focuses on a limited number of error types (see, for example, Bitchener, 2008, 2012a, 2012b; Bitchener & Knoch, 2009; Ferris, 1999, 2004). While Truscott's opposition to the practice is therefore something of an anomaly, it has inspired a rich body of empirical research that has led to a greater, more nuanced understanding of how best to correct errors. Before discussing these insights further, the article turns to theoretical perspectives on error correction in order to evaluate Truscott's claim that the ineffectiveness of error correction is theoretically predictable.

Theoretical Perspectives on Error Correction

Considering Polio (2012) discusses the relevance of six second language acquisition theories to the error correction debate: generative theory, processability theory, the usage-based approach, skill acquisition theory, the sociocultural approach and the interactionist perspective. Of these six theories, the last three are the most pertinent.

Skill Acquisition Theory

A general theory with its origins in cognitive psychology, skill acquisition theory can be applied to all skills, not just language learning. DeKeyser (2007), the main proponent of skill acquisition theory in the field of second language acquisition, posits that there are three stages of skill development: declarative, procedural and automatic. In the first stage, learners acquire knowledge about a skill, typically from a person with greater knowledge of the skill. The procedural stage is the process of applying the knowledge through deliberate and regular practice. The automatic stage requires that the knowledge be applied with greater speed and accuracy. The transition from the procedural to the automatic stage is usually slow. According to skill acquisition theory, then, performing tasks more quickly and accurately demonstrates learning.

The role of error correction in skill acquisition is to prevent inaccuracies from becoming proceduralised (Polio, 2012). While error correction is not guaranteed to work, it is difficult to imagine how abandoning it could lead to learning. On the contrary, when teachers do not correct, they make it harder for students to distinguish between accurate and inaccurate forms, thus increasing the likelihood of repeated errors.

The Sociocultural Approach

The sociocultural approach to second language learning derives from Vygotsky's sociocultural theory. Vygotsky believed that all learners have a zone of proximal development – that is, the difference between what learners can do independently and what they can do with scaffolding provided by someone else (Lantolf, 2012, in Vygotsky et

al, 1978). Scaffolding supports learners in applying knowledge until it is internalised. In sociocultural theory, learning can be said to have occurred when scaffolding is removed.

From a sociocultural perspective, error correction is a form of scaffolding in that it points out gaps in knowledge and goes some way towards filling them by demonstrating correct form. An early study by Aljaafreh and Lantolf (1994) investigated the effect of a sociocultural approach to error correction by giving learners the opportunity to correct their own errors and only prompting them – or, in sociocultural terms, providing scaffolding – when they could not. Aljaafreh and Lantolf found that learners gradually needed less prompting over time and, crucially, that error correction had to be compatible with their zone of proximal development. While error correction therefore has a place in sociocultural theory, it must be tailored to the individual. For instance, students requiring more scaffolding may benefit from more direct correction, whereas for students needing less scaffolding it may be enough to indicate the location of errors. A shift from direct to indirect error correction could be interpreted as evidence of learning.

The Interactionist Perspective

The interactionist perspective originates in research into oral interaction. Despite this, Polio (2012) argues that because of its focus on feedback it potentially has the most implications for error correction. This perspective emphasises the need for input, output and feedback for second language learning, as well as the importance of attention. When receiving input, of which error correction can be regarded as an example, learners must pay attention to form; when producing output, such as a piece of writing, they must pay attention to form; feedback serves to improve output quality. Error correction identifies gaps in knowledge, thus focusing students' attention (Mackey et al, 2012). Currently, the application of interactionist principles to error correction is no more than a potentially fruitful avenue for new research. However, from this perspective error correction would seem to be essential to directing attention to form. It is hard, then, to justify abandoning it.

Empirical Research on Error Correction

The empirical research on error correction primarily seeks to determine whether error correction leads to learning and, if it does, which correction methods are the most effective. Regarding the latter, the main questions are how direct error correction needs to be and whether it is more effective if it focuses on all the errors in a piece of writing or a limited number of error types.

Direct versus Indirect Error Correction

Direct correction requires the teacher to identify errors and rewrite them in the correct form. Indirect correction involves marking the location (for example, by underlining) or type of error – usually with a code (for example, 'sp.' for a spelling mistake) or colour scheme – but leaves students to make their own corrections. Generally, researchers regard indirect

correction as more effective than direct correction (see Ferris, 1999). Ferris and Roberts (2001) investigated the impact of explicitness by comparing three degrees of correction: errors marked with codes from five different error types; errors underlined but not coded; and no correction at all. They found that students who received correction outperformed those who did not but noted no significant differences between the coded and non-coded groups of students. Chandler (2003) compared four degrees of correction: direct correction; underlining with marginal description of error type; marginal description of error type; and simple underlining. She found a positive relationship between error correction and improvement in accuracy, but her subjects benefited more from direct correction and simple underlining of errors than from description of error type. Moreover, they displayed greater improvement in accuracy if they were required to correct their errors.

Indirect correction encourages students to solve problems, whereas direct correction simply gives them the answer. It thus encourages active learning; it communicates high expectations; and, because indirect correction is faster than direct correction, it enables teachers to provide feedback more promptly. This in turn increases the likelihood that teachers stay motivated and consistent in their provision of feedback. On the other hand, indirect correction has limitations because not all errors are treatable – that is, easily marked by a code or underline (Ferris, 1999). For example, as Ferris and Roberts (2001) show, students struggle to self-correct inappropriate word choices and major syntactic errors. This is entirely predictable, given that word use is not governed by fixed rules and syntactic errors are likely to stem from multiple misunderstandings that a code or underline cannot realistically help a student to resolve. To resolve this issue, Chandler (2003) suggests using a combination of underlining for errors that students can self-correct and direct correction for those that they cannot.

Methodological Issues and Limitations

Writing in response to Chandler (2003), Truscott (2004) argues that studies that compare the effectiveness of different correction methods without including a control group that receives little or no correction at all do not constitute evidence on the relationship between error correction and learning. For Truscott, this is equally true of studies that show that correction leads to improvement in accuracy over the course of a study because this improvement could be due to other factors, such as writing practice, in-class input or outside exposure. While this possibility cannot be dismissed, researchers cannot control their subjects to the extent that Truscott implies is necessary: they cannot prevent them from practising their writing, accessing in-class instruction or exposing themselves to the language – and nor should they want to. If Truscott's criticism were accepted, research involving subjects would have to be systematically discounted for failing to meet these unattainably high standards of control.

In a more constructive discussion of the need for control groups, Ferris (2004) explains that although studies comparing the long-term impact of error correction with that of no

correction would be an appropriate starting point, in practice few studies take this approach. Ferris attributes this to a reluctance to put students' progress at risk by deliberately depriving them of something that is thought to be so vital. Since the cornerstone of research ethics is to do no harm, this merits the utmost consideration. It does, however, create a 'methodological "Catch-22"' for researchers interested in the long-term impact of error correction on learning (Ferris, 2004: 56).

On the one hand, studies that include a control group are criticised because they do not assess the effectiveness of error correction in the long term. Put another way, the fact that students' accuracy improves from one draft of a piece of work to the next does not prove that error correction helps them in future pieces of work (Truscott & Hsu, 2008). On the other hand, studies conducted over a period of time are deemed to be insufficiently controlled. In other words, other factors may be responsible for the improvement. Ferris (2004) suggests two solutions to this methodological conundrum. Firstly, two groups taught by the same instructor could be compared over a semester, with one group receiving indirect correction and the other receiving only a summary of grammar problems with no in-text correction. Alternatively, it may be possible to use volunteers as subjects, thereby sidestepping the risk of causing harm to students on university courses. This does, however, make the recruitment of subjects harder, and the subjects are likely to have varying language levels and experiences of instruction.

The need to address these methodological shortcomings has provided the impetus for studies of error correction that are both controlled and longitudinal.

Focused versus Unfocused Error Correction

Focused error correction targets errors of certain types and leaves errors of other types uncorrected. Unfocused error correction – the more traditional method – targets all error types. In recent years, researchers have suggested that unfocused error correction produces a 'cognitive overload' for students (Bitchener & Knoch, 2009: 204). More recent research into error correction has sought to address this concern as well as the methodological issues discussed above, resulting in numerous controlled, longitudinal studies of focused error correction. Bitchener (2008) conducted a two-month study focusing on the use of the English articles 'a' and 'the'. He compared four degrees of correction: direct error correction with written and oral metalinguistic explanation; direct error correction with written metalinguistic explanation; direct error correction; and no correction. To assess the long-term effectiveness of error correction, Bitchener had participants sit a pre-test on which they received feedback, a post-test straight after the feedback and a second post-test several weeks later. Participants had to produce new pieces of writing in all three tests.

Error correction was found to result in improved accuracy in the use of English articles, particularly when supplemented by written and oral metalinguistic explanation (but, interestingly, not by written metalinguistic explanation only). Bitchener tentatively suggests

that short group lessons on targeted error types might be as beneficial as the one-to-one teacher–student meetings used in a previous study (Bitchener et al, 2005). Bitchener and Knoch (2009) performed an almost identical study that took place over ten months and included three post-tests. Although the results are not presented in a way that demonstrates the effect of metalinguistic explanation, they do support the finding that focused, direct error correction is positively related to improved accuracy.

In a similar study that incorporated dictation and error correction tests into the pre-/post-test design, Sheen (2007) also found focused, direct error correction to be effective. In addition, she investigated how the effectiveness of error correction varies as a function of students' language analytic ability (Skehan, 1998) – that is, 'the ability to analyze language by creating and applying rules to new sentences' (Sheen, 2007: 259, in Sawyer & Ranta, 2001). Theoretically, students with high language analytic ability benefit from error correction more than students with low language analytic ability because they are more able to compare linguistic structures and thus apply corrections to new pieces of writing. The results of Sheen's study corroborated the theory. This study is therefore valuable not only because of its rigour but also because it reveals how the effectiveness of error correction varies among students of differing abilities.

Implications for Practice

Based on the theoretical and empirical literature on error correction, it is recommended that, where possible, teachers opt for focused error correction in order to prevent cognitive overload for students and reduce the likelihood of a loss of self-confidence or motivation in students who make frequent errors. An additional advantage of this approach is that it may increase the accuracy and consistency with which teachers correct errors, since focusing on only a few error types reduces the cognitive load on them, as well as on students. This is particularly significant, since the potential for errors by teachers is one of the main reasons why Truscott (1996) claims error correction to be ineffective.

In line with a sociocultural perspective on language learning, it is likely that this approach will need to be adapted to the individual student. Most importantly, error correction must be commensurate with the stage of language development. For students who make frequent, basic errors, targeting more complex errors may be counter productive. On the other hand, for students with a solid command of the taught structures, highlighting errors with more advanced structures may provide avenues for independent study, especially if this is indicated in a summary of feedback. As recommended by Bitchener (2008), it may also be pertinent to supplement error correction with short lessons on targeted features if these are common to many students.

Despite its advantages, focused error correction may also create some problems. As Lee (2016; see also Yeo & Lee, 2018) demonstrates in her analysis of teachers' experiences of using focused error correction, it is difficult to implement this kind of approach if it is only

taken by one or two teachers because colleagues and students compare. Because of the widely held belief that error correction is invaluable, an approach that targets only certain types of error, rather than all errors, may be misinterpreted as harmful to students. Objection to focused error correction may be particularly strong if used on summative assessments, as students may struggle to accept the notion that they are being 'marked down' for errors that they cannot see. These problems can be resolved, however, through open discussion with students about which error types are targeted and the potential benefits of this approach, as well as the frequency of feedback, type of feedback and expectations about follow-up work (Bitchener & Knoch, 2009). As Lee (2016) argues, it is also necessary to create a supportive and motivating environment for innovation.

Conclusion

The existing theoretical and empirical literature on error correction strongly suggests that the practice can lead to learning. It should therefore be continued. That said, Truscott's (1996) case against error correction has been and continues to be invaluable for motivating researchers to carry out rigorous studies of error correction, and this has resulted in a deeper understanding of how best to correct errors. Based on these studies, it is suggested that, where possible, teachers opt for focused error correction that is compatible with the stage of language development.

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Maximising the Engagement of Criminology Students in the Virtual Classroom

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Abstract

Maximising student engagement in the classroom is a heavily researched area in pedagogic theory. However, these problems have been heightened by the pandemic and for many, the move to a 'virtual classroom' can be challenging. The objective of this research is to firstly, examine the new challenges faced by both staff and students in an online environment such as: issues with surveillance; mental well-being and the pressure staff may feel to justify university fees when students do not feel that they are getting the same university experience as they would in face-to-face learning environments. The focus will be on criminology students in particular, using secondary research on student engagement and discipline related research on the effective teaching of criminology. The combined research will result in suggestions for criminology lecturers on how to adapt their teaching style to maximise the participation of their students as well as advising on the best techniques for teaching online.

Introduction

The aim of this article is to advise criminology lecturers on methods of best teaching practice for the virtual classroom in light of the problems raised by Covid-19. This research will consider the factors affecting student participation in the online environment and how they have been heightened due to the pandemic. Furthermore, there will be a consideration of the pedagogic theory surrounding the teaching of criminology before concluding with a framework to increase the participation of criminology students online.

Student engagement has been defined as the "time and effort students devote to educationally purposeful activities" (Australian Council for Educational Research, 2010b). A student's attendance does not necessarily mean that students are *engaged* with the content (Moallem, 2003). As such, a lot of research has been dedicated to the effective teaching of criminology and how to teach online, but there is a gap in the literature combining the two concepts.

The purpose of this article is therefore to address these challenges and to adapt current teaching methods to ensure that students are engaging in the virtual classroom as they would face-to-face. Furthermore, this article will provide criminology lecturers with

suggestions to improve their practice and development as a lecturer whilst ensuring a student-centred approach throughout.

The methodology of this study is limited to secondary research. The secondary research will consist of a collation of existing literature from books, journals and scholarly articles from different disciplines surrounding the topic to address the research questions. The advantages of secondary research are that it is time and cost-effective and enables the researcher to form a comprehensive analysis of the topic due to the wide range of literature available (Dunn et al, 2015).

This article will begin with a literature review to address the current problems with student engagement in the classroom and the recommended solutions. The literature review will also include theories of best teaching practice for criminology. The second part of this essay will focus on the issues with online teaching and learning faced by both student and teacher. Part three will include my suggestions based on pedagogic theory to best address and resolve/limit these issues in the virtual classroom before concluding with the key findings for enhancing criminology students' online participation. Although this article is focused on criminology, the findings can be adapted to suit most social sciences.

Part one: Literature review

This literature review will examine why student participation is important in Higher Education and identify the key factors affecting student engagement face-to-face and in the online classroom. There will also be a discussion on the effective teaching of criminology, which is aimed at increasing student engagement and understanding of the programme. There is a gap in the literature as these issues have been researched separately. Therefore, this literature review will form the foundations for the suggestions in part three which will combine the findings of the literature to suggest an approach for online teaching that will increase student participation in the virtual classroom.

For decades researchers have established the positive links between student engagement and academic success. Students with high levels of participation and engagement with the content are more likely to graduate and achieve higher grades (Fredricks et al, 2004). Additionally, St. Ogne and Eite found that participation is crucial for increasing students "interest and motivation in the learning process" (2017). In contrast, researchers have recognised that low rates of participation and engagement can lead to depression (Li and Lerner, 2011), loneliness and result in students withdrawing from their studies (Ozaydin Ozkara and Cakir, 2018). A lack of participation not only affects the students' performances, but it was also found to be the biggest challenge faced by teachers in the classroom (Fredricks, 2014).

Increasing student participation is a complex issue (Kahu, 2011). This is because there are a wide range of factors that can affect student engagement in higher education. Kahu

established four separate approaches to better understand these factors: effective teaching practices;¹ psychological perspectives;² socio-cultural factors³ and a holistic perspective which combines all the matters. Historically, Universities' approach to student engagement focused only on elements in their control, such as the teaching style. Whilst this can increase student participation, Kahu argued that by excluding other factors, such as student expectations, emotions and motivation, the solutions would be limited (2011).

There has been a rapid increase in the number of online enrolments⁴ in the past decade (Tichavsky et al, 2015), therefore comprehensive research has been undertaken to assess the quality of these courses (Muirhead, 2000,2001). Online education has widened the access to higher education, offering opportunities to those demographics⁵ who would otherwise be excluded from the 'traditional' university experience (Stone and Perumean-Chaney, 2011). Online learning environments also add the benefit of flexibility and convenience for students (Horvath and Stone, 2004), they are cost-effective⁶ (Means et al, 2009) and encourage the use of technology to advance teaching and learning (Miller, 2019). Furthermore, research has found that online students out-performed students receiving face-to-face tuition (Means et al, 2009). Despite this, there is still a negative perception of online teaching and students have been reported to "prefer" face-to-face teaching (Delaney et al, 2010; Tichavsky et al, 2015).

The literature suggests that interaction is the fundamental feature of a successful online learning environment (Baker, 2010; Paechter & Maier, 2010).⁷ Unsurprisingly, Boston et al found that "a lack of interaction creates dissatisfaction among students" in the online classroom (2011). These results were affirmed in Tichavsky et al, suggesting that interaction levels were insufficient in both "student-student and student-teacher interactions in a distance learning environment" (2015). Students did not equate the quality of online communication to the social interaction received in face-to-face teaching. Therefore, students felt that they would not have sufficient interaction with teachers in online courses and favoured face-to-face teaching (Tichavsky et al, 2015). Donlevy observed that "social and emotional aspects of learning are as important as the technical information" (2003:120). Furthermore, Conley (2015) has maintained that social and emotional skills such as self and social awareness, self-management and responsible decision-making are vital skills that university students need to develop in order to succeed in higher education.

¹ Known as the behavioural perspective. Teachers should ensure that they are adhering to principles of good teaching practice.

² This perspective suggests that a student's engagement is based on their own internal processes.

³ This takes into consideration social and cultural backgrounds.

⁴ This includes degrees that are fully online, blended courses (mixture of face-to-face and online learning) and distance learning courses that do not use live seminars.

⁵ For example, due to disability, economic factors, role as parents/carers.

⁶ Fully online degree fees tend to be cheaper. It is also cost-effective for universities.

⁷ Applies to traditional learning environments too.

In addition to this, Savenye found that students who lack motivation and independence had lower success rates in the online environment (2015). These issues were determined to have been heightened by the lack of social interaction and the absence of a 'community' (Rovai, et al, 2005). Research has demonstrated that students' perceptions of online learning are that they are "impersonal and confusing" (Tichavsky et al, 2015). On the other hand, students suggested that the presence of a physical tutor would increase their motivation. This was linked to the fear of the repercussions for non-attendance, such as 'falling behind' (Tichavsky et al, 2015). Furthermore, students stressed the importance of the tutor's verbal reminders of upcoming deadlines. Generally, students felt they could not be trusted with the independence provided by the online learning environment and preferred to receive their motivation from the tutor rather than "forcing" themselves to complete the work (Tichavsky et al, 2015).⁸ A more recent study by Ozaydın Ozkara and Cakir suggested that student's greatest issue with online learning was "technical problems caused by the internet" (2018).

The consensus in education research is that students' performances are enhanced with *active learning* techniques (Beckerson et al, 2020). Chickering and Gamson identified active learning as a key principle for good practice in undergraduate teaching (1987).⁹ This means that students should not have a passive role in their education, such as listening and reciting material. Instead, students should be challenged with different teaching methods that enable them to independently analyse, apply and evaluate their learning¹⁰ (Leicester Learning Institute, 2020). Little (2016) argues that active learning methods also provide teachers with valuable insights of the students' understanding that enable them to assess their students learning. Furthermore, as active learning encompasses a wide range of teaching methods, Kahu suggests that active learning addresses both behavioural and psychological issues of student engagement (2011).¹¹

Hamilton (2013) suggests that active learning techniques are the most efficient tool when teaching criminology. Further reporting that engagement with real issues relating to crime and punishment, collaborative group work, participation and dialogue are crucial for encouraging students to be active learners and critical thinkers. Ancrum argues that criminology lecturers should adopt a 'biographical' approach to explore theoretical issues. He observed that by discussing his own experiences with the criminal justice system, it prompted reciprocation from the students. This led to students feeling 'safe' to relate to

⁸ Particularly if the course is asynchronous.

⁹ For a review of active learning techniques in the online classroom see: Kleinman, S. (2005) Strategies for Encouraging Active Learning, Interaction, and Academic Integrity in Online Courses, *Communication Teacher*, 19:1, 13-18.

¹⁰ Chickering and Gamson state that students should be able to discuss and write about what they have learnt, relate it to their own experiences and apply it to their daily lives (1987).

¹¹ For example, by using a range of activities such as think-pair-share, collaborative work, independent research, polling etc. different types of students learning needs can be met.

their own experiences and share these in a group setting discussion (2011).¹² Ancrum's biographical approach confirms the findings in Garrison et al (1999). Garrison's 'Community of Inquiry' model has stressed the importance of social presence in higher education. The research suggests that in addition to active learning activities, the authenticity of the lecturer is a necessary factor for encouraging participation and collaboration among students.¹³

Kolb (1984) suggested that students learn by "reflecting on their experiences"¹⁴ before they can process ideas and take into consideration the content of the information communicated to them. This thought process is then applied to problem solving. Kim advocates for criminology to adopt a 'problem-based' learning model (2014). Problem-based learning is a student-centred approach to teaching. It encourages students to undertake research and to "learn knowledge and skills while solving real work problems" (Kim, 2014).

The analysis of case studies and problem questions are often referred in the literature as key active learning methods to be used by the social sciences. Case studies have been used as a centrepiece for increasing student engagement and understanding of the course content. There are three-key advantages of using case studies in criminology. Firstly, "they help students understand complex and complicated issues" (Kunselman and Johnson, 2004). Criminology is encompassed by a wide range of theories that analyse crime and society, these are seen as 'essential tools' for teaching (Williams and Rodeheaver, 1995). However, they are also the most challenging and difficult to understand (Williams and Rodeheaver, 1995).¹⁵ By relating these often-abstract concepts to realistic problem questions or real-life case studies, students benefit from the simplification and understanding of how the theory is relevant to their daily lives (Kunselman and Johnson, 2004).

This leads to the second advantage, case-studies "encourage discussion on policy and decision-making ideologies that either are politically or socially motivated" (Kunselman and Johnson, 2004). It is a vital for criminology students to understand why and how policy decisions affect the criminal justice system. More importantly, the students should be able to analyse policy and legislation and identify the motivations behind their implementation.¹⁶ These critical analysis skills can be tested and improved through case studies. For example, by assigning the students case files of defendant's criminal convictions and asking them to

¹² This approach can apply to all social sciences.

¹³ Social presence is defined as "the ability of participants in a community...to project themselves socially and emotionally as 'real' people". The other two elements in Garrison et al's model for creating a deep, meaningful learning experience are cognitive and teaching presence. For a detailed analysis of the Community of Inquiry Model please see: Garrison, D.R., Anderson, T., Archer, W. (1999) Critical Inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*. 2(2), 87-105.

¹⁴ Known as Kolb's 'learning cycle'.

¹⁵ This is problematic for criminology lecturers too as they have to ensure the appropriate teaching method is used to maximise the students understanding of often complex theories.

¹⁶ For example, students could be promoted to discuss if the policy/legislation is an attempt to deter crime. Or, it could be a political parties motivation to appear more tough on certain crimes, whilst also considering who are the people most affected by the policy/legislation etc.

act as a judge and to make a sentencing decision. This will encourage discussions on policy, such as on the sentencing guidelines and the aggravating or mitigating circumstances to consider. It will also engage the students with wider issues within the criminal justice system, such as the overpopulation problem in prisons and the issues of racial injustice with sentencing.

It is important to note that the assumption that case studies are an effective teaching method relies heavily on the student's participation. As such, the third benefit of case studies highlighted by Kunselman and Johnson (2004) is that they engage the students in educational and focused class discussions as case studies should be selected for their relevance and significance to the topic. Moreover, studies have confirmed that students respond positively to initial guidance and information from the teacher to prompt classroom discussions (DuPont-Morales, 1998). Therefore, it is essential to take the lead as the practitioner and to stay involved throughout the discussions, proposing further questions and asking the students for the thought process behind their answers. Wolfer and Baker (2000) evidenced that cooperation among students promotes critical thinking and it enables the students to learn from each other. Case studies are an efficient way to foster collaborative learning, and this can be further encouraged with the use of discussion forums.

It is apparent from the literature that active student engagement is vital for academic success. The pandemic resulted in major changes to the way most lecturers teach and therefore a guideline for best practice is required to adapt to online learning.

Part two: Issues heightened by Covid-19

"It's a running joke among students that we are paying for the most expensive streaming service in the world" – University Student to Metro.co.uk (2021).¹⁷

Despite best efforts from the education sector to adapt to digital learning and continue to provide high-quality live seminars, it is evident that some students still do not equate this experience with face-to-face learning. Numerous petitions by students have asked that the government compel universities to partially refund tuition fees for 2020/21 where students seminars were moved online due to Covid-19. The rationale behind one of the petitions was that "students should not have to pay full tuition fees for online lectures, without experiencing university life" (Petition 324762, 2020). The petition was signed by over 260,000 students across the country. Another petition with over 350,000 signatures requested that student fees be reimbursed as access to only online materials does not equate to £9,250 worth of fees (Petition 302855, 2020) The government response in September 2020 stated that universities are committed to delivering "high-quality" courses and that students should complain to their Higher Education provider if they are unhappy

¹⁷ Mendenez (2021).

with the quality of their service (Petition 324762, 2020). However, many academics have rejected the approach that students are consumers in higher education, as Bunce et al (2017) found that this perspective was associated with lower academic performance.

The overall university experience of students has been deeply affected by the pandemic, students have reported feeling high levels of anxiety, loneliness, hopelessness and boredom as well as the added fear of the pandemic (Akyıldız, 2020). Additionally, lecturers are faced with almost double the workload when adapting their content to facilitate online learning and further pressures to provide the same learning experiences¹⁸ to disgruntled students (Batty, 2020). Dutton and Mohapatra (2021) argue that the move to online learning in light of Covid-19 should be properly defined as “emergency remote teaching” and does not reflect the standards of an established online education programme. This is not to say it is the fault of the lecturers, rather, the short space of time available to adequately adapt to a whole new learning model. This section will discuss how existing problems with student participation levels were heightened by the pandemic.

Research has suggested that students struggle to pay attention for a long period of time in an online learning environment (Iwai, 2020). This combined with the additional distractions from being at home can make the move to online learning even more difficult.¹⁹ More importantly, evidence suggests that student’s mental health has been severely affected due to the nationwide ‘lockdowns’²⁰ and lack of social interactions (Savage et al, 2020). Students’ expectations of university go beyond just education and emphasis is also placed on experiencing the full student lifestyle.²¹ After all, many students are paying for accommodation, facilities and services that they cannot access. This has caused conflicts and even legal actions for refunds against Higher Education providers (Cappellino, 2020).²²

Consequently, Dutton and Mohapatra (2021) have recognised that it is becoming increasingly difficult for lecturers to identify students that are losing interest or struggling on online courses. This has been attributed to a lack of face-to-face interaction as some students may not keep their cameras on during seminars. This is also making it challenging for lecturers to gauge the atmosphere of the class and engage the students in group discussions. The repercussions of this are that students do not feel supported by their institutions and there could be lasting implications on final grade assessments due to a decline in student participation (Mendenez, 2021).

¹⁸ The same as they would face-to-face.

¹⁹ More access to phones, tv, other members of the household, childcare/caring duties etc. are all factors that could affect the attention span of students.

²⁰ Refers to when the U.K. government imposes restrictions on going out by closing all non-essential shops, restaurants and services. The government guidelines require citizens to stay at home and to not mix inside with other households.

²¹ As mentioned in the petitions.

²² Over 70 universities were sued in the United States by students demanding refunds for tuition fees.

However, there are many factors as to why students may not want to keep their cameras on. For example, some students may be introverts, and this can also be affected by cultural behaviours. For example, Zhong (2020) found that Chinese students were reluctant to keep their cameras on due to their traditional Confucian culture, which encourages people to be “humble, low-key and introverted”. Furthermore, Zhong discovered that some students were concerned about their image and would not be willing to present themselves on camera unless they are dressed smartly or wearing makeup.²³ In addition to this, students may not want their camera’s on as it would consume more broadband data and reduce the quality and the stability of the stream (Zhong, 2020).

The issue of privacy and security has also been heightened by the pandemic as many students have been raising concerns about surveillance in the virtual classroom (Schaps, 2020; Daniels, 2020; Bajpai, 2020). It has been suggested that students “fear being exposed to the camera” (Zhong, 2020). For example, some students may not want their face or voice to be recorded and available for the whole cohort to see (Dutton and Mohapatra, 2021).²⁴ Furthermore, some students believe that having their cameras on would reveal private information about them and their homes, for example how rich, clean or tidy they are (Zhong, 2020). Additionally, *Zoom* were the target of security threats where uninvited guests could enter virtual classrooms and disrupt the seminars.²⁵ Students are growing increasingly concerned about their privacy on third-party conferencing services and about how their data is used and collected (Schaps, 2020). A solution suggested by Chen (2020) states that lecturers should make the students aware of the privacy and security risks associated with online technology.

The issue remains that the move to online learning has been difficult for both students and teachers, but the future is still uncertain until mass vaccinations can be used to control the virus. Therefore, moving forward institutions should ensure that the appropriate infrastructures are in place to facilitate effective online learning.

Part three: Suggestions for best practice in the virtual classroom

The literature has evidenced that perceptions of online teaching are not always positive. This has been worsened by the pandemic as many lecturers had to quickly adapt their teaching methods resulting in some uncertainty and dissatisfaction from students not receiving the full university experience. This section will outline important measures lecturers can adopt to resolve or limit the issues faced in the virtual classroom whilst adopting a student-centred approach throughout.²⁶

²³ Zhong found that students did not always have the time before class to get ready.

²⁴ Particularly introvert students.

²⁵ Known as ‘zoombombing’.

²⁶ Whilst this article applies to criminology, the suggestions can be used and adapted for most programmes.

1. Acknowledge the pandemic and the changes it has brought

Whilst this sounds obvious, Lee-Heart (2020) stresses the importance of engaging with the pandemic in the virtual classroom. In doing so, the effects of the pandemic on the students are acknowledged and legitimised (Lee-Heart, 2020). A simple way to do this would be to have a routine “well-being check-in” with the students, this can be an informal chat before or after the seminar to gauge how the students are coping with the pandemic. Lee-Heart (2020) found that over time students were becoming increasingly comfortable with sharing their experiences. This will benefit students as they will feel heard and valued, and also help build rapport in a virtual setting.

Criminology lecturers should also engage with the pandemic as a topic (Lee-Heart, 2020).²⁷ For example, by asking students to find articles relating to the effects Covid-19 has had on the workings of the criminal justice system; or using it as a focus of assessments.²⁸ This will require students to draw on their existing knowledge and critically analyse pandemic pedagogy. It also acts as an important link between reality and theory, as students will be able to understand how criminological theories are put into practice.

2. Active-learning and technology

Technology can be challenging and unpredictable as students and teachers can face issues with connectivity that can be disruptive to the learning experience (Loknath et al, 2020). However, when utilised effectively, technology can really elevate the levels of student engagement. Fleishman (2020) suggests that lecturers should first address and explain the added security and privacy risks associated with the virtual classroom, this ensures students are properly informed and should consequently feel more comfortable online. Lecturers should also adopt a policy where students have the option to opt-out of being recorded for an added security measure and to respect the student’s privacy.

The great thing about technology is that it enables innovative methods of teaching. The consensus states that active learning methods are most effective for student engagement and most learning activities can be adapted for the virtual classroom. Online conference services such as *Zoom* enable group work, class discussions, polling and students can even raise their hand virtually.²⁹ This can be particularly effective for engaging introvert students who may find the traditional classroom setting uncomfortable and intimidating (Akinbode, 2015; Sharma et al, 2005). When considering inclusivity, lecturers should also make use of

²⁷ Please note this article is not specific to teaching criminology.

²⁸ E.g. increased use of stop and search on black men in London during lockdown; the growing number of backlogged cases as some defendants have to wait until 2023 for their court hearing; the issue with jury trials and whether they should be suspended during the pandemic.

²⁹ Students can also share their screens with the rest of the class and use the whiteboard, all the features can be controlled by the lecturer so can be limited at any point to minimise distractions.

services such as *MentiMeter*.³⁰ The anonymity feature ensure students have the opportunity to engage in class discussions whilst diminishing the fear of ‘getting the question wrong’. Furthermore, *Mentimeter* provides opportunities to consolidate the students learning and offers valuable insights for students as they can exchange thoughts and knowledge with their peers (Little, 2016).

Isalia (2016) argues that game-based learning allows students to obtain a ‘positive learning experience’ and increases students’ motivation for learning. This can be adopted in criminology, whereby case studies can be presented as a gaming format and students can work through the activity in groups or individually. For example, students can access websites such as “You be the Judge”, where they are presented with a series of case studies and have to consider aggravating and mitigating circumstances before deciding on an appropriate sentence.³¹ There are a series of questions along the way and the correct sentence is explained in detail to ensure the students understand how the outcome was reached. This can then be enhanced by class discussions afterwards where the students can compare their results.

3. Compassion and communication

Compassion is defined as a “motivation/an intention to notice, not normalise, one’s own distress or disadvantages, or that of others and take action to reduce or prevent it” (Compassion in Education, 2020). Martinez (2020) argues that compassion in education is now more important than ever in the face of a pandemic. He further stresses that practitioners should not be requesting unnecessary demands from their students during these difficult times. A simple way to show some compassion to students by respecting their preferred methods of engagement. For example, by allowing students to choose whether want their cameras on or whether they want to conversate by microphone or chat rather than demand it. A major benefit of online learning for students is the added flexibility, lecturers should not restrict that as there could be many external factors affecting the way students engage online.³² Rather, by treating the students as adults who can make their own choices, students will feel more respected and comfortable in the learning environment, which should facilitate higher levels of engagement.³³

Students should also be equipped with the compassionate micro skills of communication (Gilbert et al, 2018). Group work in particular is an effective activity to instruct students on

³⁰ Mentimeter is an interactive presentation software. It enables live polling and class discussions with added anonymity.

³¹ <http://ybtj.justice.gov.uk> – The case studies are presented by a series of videos (transcripts are also available). Activities like this can also be used in a flipped classroom. For example, students could complete relevant reading material on sentencing beforehand and work through the case studies in class.

³² For example, bad connectivity, responsibility duties, noisy household, they may only be using their phone rather than a laptop/computer.

³³ You can also make this fun; informal interactions are also important in education. Lecturers could ask students to respond in memes, pictures and emojis once in a while to gauge the levels of engagement.

their individual use of compassionate micro skills and then assess their interactions with each other.³⁴ Gilbert's results found that these micro skills foster "creative, critical and compassionate graduates". Furthermore, this leads to graduates who are "motivated and equipped to build co-operative, interdependent communities locally and globally" (Gilbert et al, 2018). In other words, this approach encourages effective collaboration and personal accountability from each student to ensure the successful functioning of the group.

Last but not least, lecturers should maintain high levels of communication with their students, especially when the online content is asynchronous. This can partially compensate for the lack of physical interaction and also ensure students are aware of the teacher's genuine presence (Martinez, 2020). Social media can also enhance the engagement between students and lecturers. For example, a lecturer could set up an educational Twitter or Facebook page to share relevant information and articles with students prompting discussions. This may entice students more than traditional discussion boards and can create a sense of community amongst the students during times of minimal social interaction.³⁵

Conclusion

In conclusion, whilst the move to the virtual classroom has been daunting it has also provided the feeling of "psychological safety" (Loknath et al, 2020).³⁶ Luckily for criminology lecturers, the module content can be easily adapted to suit an online learning environment. For maximum student engagement, the key thing to remember is to increase the use of active learning activities through technology; communicate the challenges and lead with compassion. A social presence online and an authentic approach to teaching are also key factors for increasing student participation. Furthermore, to manage student expectations lecturers should not maintain that online and face-to-face learning are the same.³⁷ Rather, we should acknowledge the differences, whilst communicating the advantages and maximise the use of technology that have been designed for enhancing teaching practice.

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³⁴ Compassionate micro skills in a group setting are mainly non-verbal behaviours that facilitate cohesion and communication, for example eye contact and supportive body language (Gilbert, 2017:189-202).

³⁵ In my own practice, I like to recommend relevant documentaries, series and podcasts for students as well as academic articles which can be difficult to understand (especially for first years).

³⁶ In the sense that we are safer in our own homes than in the classroom.

³⁷ This is important if face-to-face teaching was specified in the Definitive Module Document or University UPRs.

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How does active content creation and storytelling contribute to student engagement on a module site?

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Abstract

The notion in the digital marketing world is that content is king (Muller & Christandl, 2019). If this is the way we know and understand that consumers are operating, especially millennials and Generation Z (Saura, Debasa, & Reyes-Menendez, 2019), how are we adapting this into the way we teach this generation of students? With engagement in the classroom already being low (Uchidiuno et al, 2019), how can we take knowledge and theory from the digital marketing world and apply it into the world of teaching?

Using content creation techniques combined with online teaching techniques a module website has been designed for the Principles of Marketing module of 2020. This paper explores and compares how online engagement has been influenced on the module site by comparing the site analytics of the previous year to this year while also considering the mid-module feedback from students.

Introduction

In recent years Universities around the world started exploring the blended learning approach (Williams, 2008). Singh (2003) explains blended learning as combining offline and online forms of learning where online means with the use of the internet and offline suggests that it happens in a normal classroom setup. The blended learning approach has been used, explored and researched by many.

Adapting teaching styles was not the only consideration that has to take place during the pandemic. Adapting content for Millennials and Generation Z with a blended learning approach needed to be another consideration during a usual blended learning approach but even more so during the pandemic (Barber, 2020; Shatto & Erwin, 2017).

According to Roberts, Newman and Schwartzstein (2012) and Shatto and Erwin (2017) millennials and generation Z students share many similar characteristics. One of the many are their deep understanding and appreciation of technology and social connectedness (Roberts, Newman & Schwartzstein, 2012). Roberts, Newman and Schwartzstein (2012) goes on to say that these learners might not engage well with traditional textbooks but rather actively engage with modern forms of media to explore their curiosity, research their answers or understand their learning by using different forms of digital content. This

corresponds closely to the way consumers use digital media platforms by considering consumers are more likely to engage with content that is entertaining, educational and inspirational (Chaffey & Ellis-Chadwick, 2016; Kruse, 2015; Hootsuite, 2018).

Another way of looking at engaging digital marketing content is for it to focus on the consumer's interest or goals and point out potential pain points around products and services that may help them in the future (Hootsuite, 2018). Therefore, organisations should focus on providing content that is meaningful to the community along with a platform where members can engage and exchange knowledge while entering in a social exchange with them (Deighton & Kornfeld 2009).

Mangold and Faulds (2009) suggests that within the context of digital marketing, organisations focus on display advertising, sponsored content, pictures, infographics, videos, quizzes, competitions, and short movies to make it easier for customers to engage with content.

Adding to this, Megehee and Woodside (2010) reports that using the mentioned media / visual forms while adding a story narrative to it, may help customers interoperate and create a common yet authentic experience around the product or service while encouraging engagement (Chiu et al., 2012; La Tour & Brainerd, 2014). Motivating that, stories relate better with the human brain since the human brain processes information in the form of stories when piecing information together Megehee and Woodside (2010).

Within this context, a module site has been designed using the University of Hertfordshire Guided Learner Journey while focussing on the digital marketing content creation concepts. This paper will explore what can be learned from comparing a previous module site to the one at hand with the focus on engagement.

Literature review

Blended learning

While only an academic suggestion until recently, blended learning became a blanket approach for most lecturers and universities due to the Covid-19 pandemic (Ebner, 2020; Kedraka & Kaltsidis, 2020). In response to the impact of Covid-19 on opportunities for face-to-face learning, teaching and assessment on campus, blended, hybrid and online learning approaches have been prioritised by universities over the world (Ebner, 2020; Kedraka & Kaltsidis, 2020).

Singh (2003) explains that, in its simplest forms, blended learning followed an offline/ online approach. Offline being face-to-face class sessions and online being via the internet.

Singh (2003) goes on to group the learning approaches into three groups (see Table 1)

Table 1: Singh (2003) Learning approaches and choices for a blended learning approach:

Type	Methods
Synchronous physical formats	<ul style="list-style-type: none"> ● Instructor-led Classrooms & Lectures ● Hands-on Labs & Workshops ● Field Trips
Synchronous online formats (live e-learning)	<ul style="list-style-type: none"> ● Online Meetings ● Virtual Classrooms ● Web Seminars and Broadcasts ● Coaching ● Instant Messaging ● Conference Calls
Self-paced, asynchronous formats	<ul style="list-style-type: none"> ● Documents & Web Pages ● Web/Computer Based ● Training Modules ● Assessments/Tests & Surveys ● Simulations ● Job Aids & Electronic ● Performance Support ● Systems (EPSS) ● Recorded Live Events ● Online Learning ● Communities and Discussion Forums ● Distributed and Mobile learning

Designing content for Millennials and Generation Z

McGlynn (2005) explains that when facilitating learning it goes hand in hand to understand who students are. One of which is understanding the way different age groups learn. Shatto and Erwin (2017) reported that millennials and Generation Z learn differently while Aviles and Eastman (2012) highlight that the use of technology in the classroom can be effective when teaching these age groups. Adding technology, engaging students with adaptive learning activities, and understanding basic generational differences are ways to keep both millennials and Generation Z students engaged in learning. It is important to understand basic differences and distinctions across generations for developing pedagogy that reaches these unique student populations (Shatto and Erwin, 2017).

To do this however, Kotz (2016) and Shatto and Erwin (2017) point out that understanding the background of these generation groups will help in understanding their learning expectations better when tailoring their learning content.

When looking at the needs of these generations they want closer community role models like parents or teachers rather than celebrities (Elliot-Yearly, 2012). This leads to wanting a strong relationship with a teacher who is helpful and willing to structure out their learning for them (Allen, 2012). These generational groups enjoyed a more relaxed setting when learning such as discussions where they can voice their opinions while applying their understanding of lectures. Alternatively working in groups, in social settings with other stimuli (e.g., background music) also contributes to this (Gallagher, 2008). Adding to this, Lynch (2013) reports that millennials and Generation Z are more socially conscious and want their peers to understand and like them while also learning about different views from others.

Kotz (2016) further reports that learning objectives and outcomes are important for them by making sure they know what needs to be done during assignments and activities. Kotz (2016) also points out interpersonal skills are important along with digital aspects to their learning like e-books, videos.

Millennials and Generation Z seem to prefer an array of hands-on activities, interactive games, short video lectures, instructional demonstrations, field trips, coloured worksheet and projects (Kotz, 2016). They prefer their learning to happen within a community of other students and being connected digitally while learning at their own pace. Being able to interact or engage in class or online are very important to this generational group. Therefore, planning content that inspires them or learning competitively through interactive media can help achieve engagement, entertainment and learning. (Aviles & Eastman, 2012, Kotz, 2016; Roberts, Newman & Schwartzstein, 2012; McGlynn, 2005).

Content creation

The notion in the digital marketing world is that content is king (Muller & Christandl, 2019). If this is the way we know and understand that consumers are operating, especially millennials and Generation Z, it is important to take into account how content is generated for these groups (Saura, Debasa, & Reyes-Menendez, 2019).

In marketing theory, the idea of tribes /communities entails a change of focus from individual to micro-social level as a unit of analysis (Cova, 1997). Focussing on the link between the tribe rather than the product / service being sold (Cova, 1997; Goulding, et al, 2013) Out of this Ryll (2016) suggests that a construction or reaffirmation of self-identity, shared storytelling and meaningful knowledge exchange triggers community building and engagement on digital media platforms.

Deighton and Kornfeld (2009) also argue that organisations should focus on providing meaningful content for the community along with a platform where members can engage and exchange knowledge. Therefore, further arguing, rather than sending information to the customer, organisations must enter in a social exchange with the customers, with identity and meaning as the motivation.

Kotler et al (2017:11) and Schaefer (2019:47) report there has been a shift from product-centric marketing to human-centric marketing to reflect how communication and marketing has evolved over time. Kotler et al (2017), Scheafer (2019), Cahffey & Smith (2017) indicate that digital communication and marketing have become essential in the customers journey. However they encourage organisations not to let digital media drive relationship building with customers but rather leverage digital media to help organisations build stronger relationships with customers while the organisation takes on a more human approach to establish relationships with customers ensuring engagement.

However, using this thinking, recent focus has been placed on how branded content might work to increase interaction and engagement (Hollebeek & Macky, 2019, Kim et al., 2016; Lee, Hosanagar et al., and Lee et al, 2018; Schultz, 2017). Mangold and Faulds (2009) expands on the term of branded content by including but not limiting it to: display advertising, sponsored content, pictures, infographics, videos, quizzes, competitions and short movies.

Dessart and Pitardi (2019) takes the above into account adding that strategies used for community engagement can be complex and may require high level creativity while developing a storyline around the brand while using various types of branded content.

Research methods

The assumptions made in this article were based on existing data available to the researcher. This was due to involvement in teaching on the Principles of Marketing module for two years running.

Considering the above data available the main research is: **How does active content creation and storytelling contribute to student engagement on a module site?**

Specific research questions being:

1. What requirements for a blended learning approach and content creation can be found in the literature to encourage active engagement?
2. What can be learned about the way students engage when applying these techniques to a module site by using Canvas Analytics?
3. What are the views of students about the module site based on their mid-module feedback?

A combination of qualitative and quantitative data has been used to make the assumptions that follow.

The data was gained by comparing module site analytics, mid-module feedback and engagement activities embedded on the module site. Each of these methods are discussed below:

Literature review and building of the module site:

According to Babbie and Mouton (2001) and Du Plooy (2002), a literature study helps make the researcher and the reader aware of existing and recent research on a specific subject. Babbie and Mouton (2001) point out that when a literature study is used, to establish existing theory and research and to make certain assumptions.

For the purpose of this article the main two focuses were that of blended learning and content creation for digital marketing.

Using the existing theory and research the module site was designed. A content creation approach was followed considering blended learning approaches while also considering how millennials and Generation Z prefer to learn.

The main design of the module site focused on embedding visuals like short videos (between 1-2 minutes), infographics, mobile compatible engagement tools (like Mentimeter and Padlet) and quizzes. This was done to ensure the flow from one section of the module site to the next by showcasing the module content with digital marketing like content and engagement prompts like call to actions. This helped the setup for the rest of this article. By

adding these prompts, it should give a clear indication if a module site using theory from digital marketing content creation and blended learning approaches are more engaging for students.

By doing the literature review the first research question could be answered: ***What requirements for a blended learning approach and content creation can be found in the literature to encourage active engagement?***

Comparing module sites analytics

With the module created according to the insight gained from the literature review, the engagement rates could now be observed. This was done by investigating the analytics of the module site of 2020/2021. To further this investigation, the same module site analytics of the previous year were also observed. Consideration was given that the module site of 2019/2020 did not use the same method of creation content while following the approach of a more 'traditional'³⁸ module site layout.

Engagement and mid-module feedback

Mid-module feedback

One could argue that since there is more content on the module site of 2020/2021 it would be obvious that there could be more engagement. This would be since students have more to click and material to work through. To measure this accordingly, qualitative data insight was gained from the students of 2020/2021's mid-module feedback.

Engagement on module activities

To further this investigation, analytics of the online activities from Mentimeter, Padlet and YouTube videos was also observed to see if students engaged in these embedded methods.

Discussions and Conclusions

Discussion

By following the research methods explained above, the remaining research questions could be answered.

Comparing module sites analytics

The following observations have been made: ***What can be learned about the way students engage when applying these techniques to a module site by using Canvas Analytics?*** To be able to answer the above research question, the following needs to be considered: The 2019

³⁸ Traditional module site meaning that this site contains links to the reading, files to lecture material and recordings of the classes.

module site had 69 students in total whereas the 2020 module site had 162 students on the site.

Figures 1 and 2 show the top engagement sections of each module sites:

Figure 1. 4BUS1082 2019 Principles of marketing module site data:

Resources

Resource	Students	Page Views
Course Modules	69	5k
Course Home	69	4.8k
Sarah Breeden preferred.jpg	69	1.9k
annie2.jpg	69	1.8k
Course Assignments	68	1.3k
Marketing Report: 30% of module grade	69	672
Marketing Environment ppt slides	67	468
Market Segmentation ppt slides	65	435
Defining Marketing and Marketing Process ppt slides	66	413
Report (30% of Module)	61	343
Buyer Behaviour Slides	63	342
Course Announcements	57	316
Perceptual Maps and Growth Strategies slides	63	261
4BUS1082 Report 2018 30 per cent.docx	66	261
Introduction to the Module ppt slides	51	256
Pricing Strategy and Marketing Information slides	54	241
03_4BUS1082 Lecture 3_01_10_18_SN.ppt	65	231
Product Policy slides	57	225
Marketing Communications Slides	55	222
Online Module Test marks	60	219

Figure 2: 4BUS1082 20202 Principles of marketing module site data:

Resources		
Resource	▼ Students	Page Views
🏠 Course Home	158	22.2k
📄 2.png	154	6.6k
📄 1-1.png	154	6.6k
📄 1.png	154	6.7k
📁 Course Assignments	154	6.1k
📄 3.png	154	6.6k
📄 18891705_10155464537973112_1457176330300529306_o.jpg	154	6.6k
📁 Course Modules	153	8.4k
📄 Written piece	152	5.1k
🔗 Online Module test 2 November 8:00-19:00 (1 hour)	148	830
📄 5.png	141	1.2k
📄 Unit 1.1. Induction	141	1.4k
📄 58-1.png	141	1.2k
📄 60.png	141	1.2k
📄 57.png	141	1.2k
📄 56.png	141	1.2k
📄 59.png	140	1.2k
🔗 Online Module test 2 November 8:00-19:00 (1 hour)	137	1.8k
📄 Unit 1.2. History of Marketing	136	1k
📄 4.png	136	959

When comparing Figure 1 and Figure 2 the 2020 module site had an average of 22 157-page views, whereas the 2019 module site only had 4 818-page views meaning that 2020's module site reported 17 339 more views than 2019 making it 78% more views.

On average, the module course section, allowing students to navigate through the module site, shows 8 392 views for the 2020 module while the 2019 module shows 4 950 visits to this section.

Further, when looking at the assignment briefs the 2019 module site only has a Word file uploaded with 1 300 views. While the 2020 module site has a video explaining the assignment and has been visited 6 100 times showcasing a 4 800 increase on views.

When comparing the two module sites there is a clear increase in views when images have been used. This can be seen in the figures above with file extensions ending in .jpg. Both module sites report views of these images over 1 000 making it clear that visuals increase engagement figures.

Both module sites showcase lower number of page views towards the end of the module, however the 2019 module site shows an earlier decrease. The 2020 module site maintained its figures much longer before declining.

Although this data is limited, it is safe to say that students are more engaged with the 2020 module site over a longer period compared to the 2019 module site.

Mid-module feedback and embedded engagement opportunities

What are the views of students about the module site based on their mid-module feedback?

Although the overall engagement of the 2020 module site was a lot higher, focus needed to also be on the thoughts that students had about this site. To gain this data the module's mid-module feedback was used.

In the mid-module feedback students were given three open ended questions where they could give their thoughts and opinions about the overall module.

41% of students (n= 67) completed the mid-module feedback, however with the response rate to the questions decreasing towards the end of the question set.

These questions and the way students responded can be seen in Table 2

Table 2. Response rate on the mid-module feedback

Question	Percentage of class	N-value
1. What worked well for this module?	41%	67
2. What could improve?	25%	45
3. What do we need to clarify?	20%	33

What worked well for this module?

Based on the sixty-seven students who answer this question, thirty students (44,7%, n=30) pointed out that they enjoyed the way content was presented on the module site. Thirteen students (19%, n=13) reported that they liked the video while three students (4%, n=3) mentioned they liked the fact that the videos were short making the work easy to understand.

Twelve students (18%, n=12) also mentioned that they found the content on the module site interactive and engaging.

While eight students (12%, n=8) said that they were pleased with the structure and layout of the module site.

Five students (7%, n=5) commented that they enjoyed the fact that the content was designed in such a way that they can engage with it at their own time and pace.

Two students (3%, n=2) said that they enjoyed quizzes and Mentimeter activities.

What could improve?

Only a few comments about the content and engagement were made. Based on the sixty-seven students who took part in this mid-module feedback, three students (4%, n=3) said that they would appreciate more content and guidance on the assignment.

Three students (4%, n=3) further mentioned that they enjoyed the interactivity of the module site and would appreciate more quizzes and Mentimeter activities.

What needs clarifying?

Out of the thirty-three (20%, n=33) students who answered this question, no responses specifically addressed the online material

Engagement with content and activities on the module site:

When considering the engagement of students on the content that has been created the following observations were made (Figure 3):

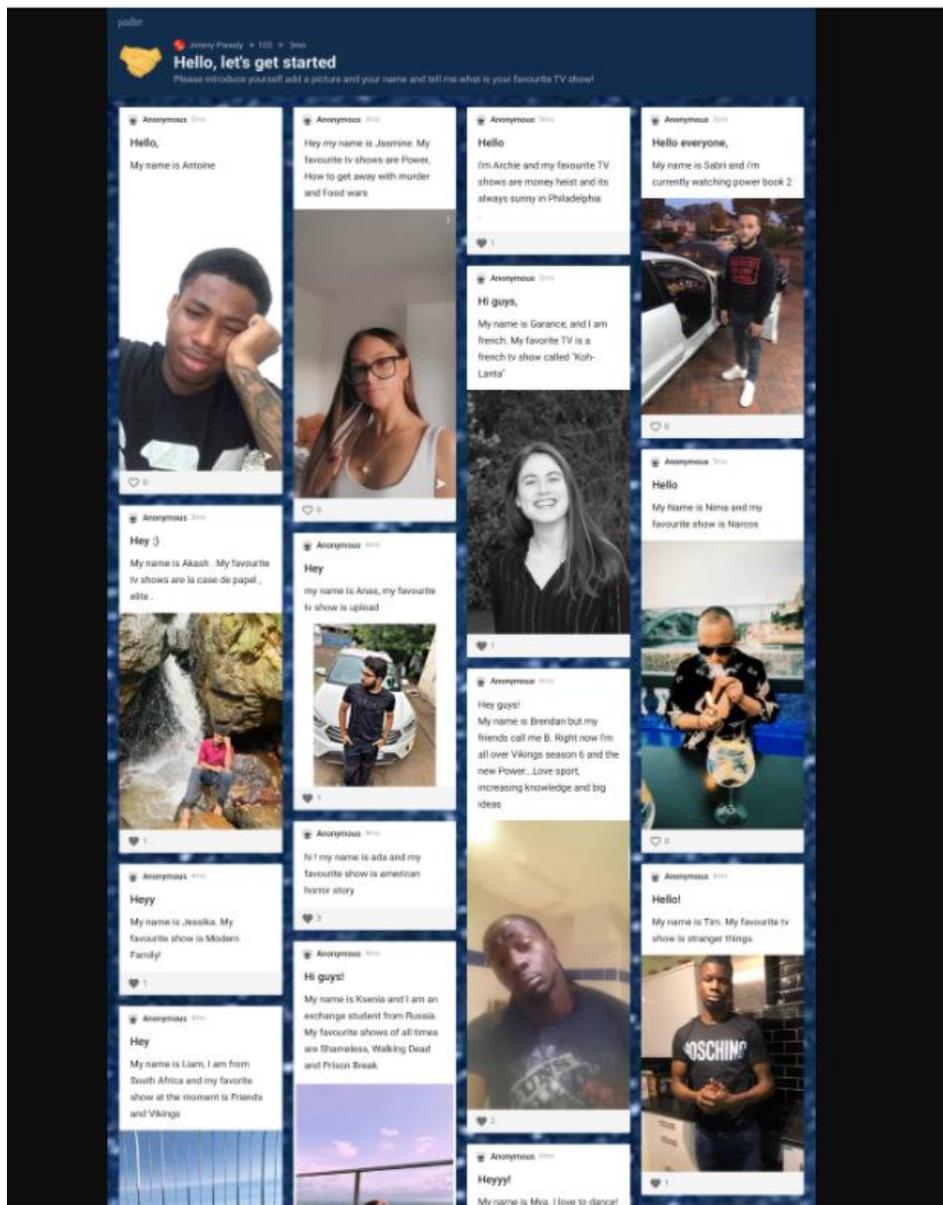
Figure 3. YouTube engagement from videos embedded on the module site

Video	Views	Watch time (hours) ↓	Average view duration	Impressions	Impressions click-through rate
<input type="checkbox"/> Total	6,363	218.1	2:03	318	12.6%
<input type="checkbox"/> Assessment	424 6.7%	43.7 20.0%	6:10	14	21.4%
<input type="checkbox"/> Unit 7 - Price	127 2.0%	10.4 4.8%	4:54	0	–
<input type="checkbox"/> Definition of marketing	197 3.1%	8.5 3.9%	2:36	24	12.5%
<input type="checkbox"/> Macro environment	175 2.8%	8.4 3.9%	2:52	3	33.3%
<input type="checkbox"/> Micro-environment	139 2.2%	6.0 2.8%	2:35	2	0%
<input type="checkbox"/> The Marketing Mix	155 2.4%	5.7 2.6%	2:12	2	50.0%
<input type="checkbox"/> The Marketing Environment	188 3.0%	5.6 2.6%	1:47	4	50.0%
<input type="checkbox"/> Overview of Segmentation	161 2.5%	5.5 2.5%	2:03	1	0%
<input type="checkbox"/> Differentiation and Positioning	134 2.1%	5.5 2.5%	2:27	2	50.0%
<input type="checkbox"/> 4BUS1082/1155 Unit 5 Live Online-class	76 1.2%	5.4 2.5%	4:16	0	–
<input type="checkbox"/> Wants needs and demands	170 2.7%	4.9 2.3%	1:44	5	80.0%
<input type="checkbox"/> 4BUS1155 0901 Understanding Marketing	60 0.9%	4.8 2.2%	4:45	0	–
<input type="checkbox"/> Consumer buyer behaviour	155 2.4%	4.7 2.2%	1:50	1	0%
<input type="checkbox"/> Growth strategies	139 2.2%	4.5 2.1%	1:55	1	0%

Based on the YouTube videos that were created and embedded into the module site a total of 6 325 views can be reported overall. These videos were viewed a total of 215.1 hours in total.

While looking at the Padlet board embedded on the module site, 103 students took part in the creation of their own content on this board meaning that 63,5% of students engaged on this method (Figure 4)

Figure 4. Padlet interaction embedded on the module site



Limitations and suggestions

While conducting this research Canvas analytics was used to report engagement of students on their module site. Canvas allows only the last two weeks in-depth data meaning that data could not be studied in-depth. The researcher had to revert to an overview of the data focussing on how the resources were used on the module site.

Future studies can capture this in-depth data to get a clearer reading of the engagement of students. Further research can also be done by having a focus group with students to determine what types of content they prefer and to find out why they liked certain content to others.

Since this module also runs in semester B, a further comparison can be done using a different set of students to see if the engagement rate reflects the same.

Further suggestions for this study, can be that it would be worth looking at the accessibility of content for students with difficulties learning. This might be taking into account how these students engage with a content heavy module site and how these module sites can encourage them to engage just as well.

Conclusion

From the limited data presented in this article it is safe to say that actively designing content like videos, images, quizzes and interactive sources leads to a higher engagement rate on a module site.

Considering that there were options between videos and images, videos tend to achieve a higher engagement rate than images. This concurs with the suggestions found in the literature from blended learning approach and content creation.

Taking the comparison of the two sites students do seem to tend to prefer the 2020 style of module presentation over the 2019 module - following the engagement prompts while moving through the module. This might be due to the storytelling and content creation concepts used to create this module site. The module site seems to be much more focused on design and interactivity leading to more opportunities for engagement.

Further assumptions can be that the module site triggered familiarity with the way Millennials and Generation Z view content on digital marketing platforms, leading to a higher engagement rate on the module site.

It is also clear from the student's mid-module feedback that this type of content enhances their experience and learning. The students also found this style of module presentation interactive and accessible mentioning that they enjoy the way content has been structured and the way they can review content easily.

Even with this contact packed module as the preferred module site design, a few students pointed out that they would like even more engagement and interactive opportunities. However, students seem to enjoy the engaging activities like Mentimeter or Padlet embedded in the module site.

An assumption can be made that this method of module site also allows students to review content more often. This assumption comes from the fact that there were more hours of viewing time reported on YouTube than the duration of the content uploaded. It can also be that students viewed these videos more since they were short in duration and easier to recap on.

This article only shows some insight into the combination of blended learning approaches and digital marketing content creation elements. This can be further explored to find out the reasons why students prefer to engage more with certain content. This will give further insight when designing module sites.

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PERSONAL TUTORING USING TECHNOLOGY: FOCUSING ON SUPPORT FOR INTERNATIONAL STUDENTS AT THE UNIVERSITY OF HERTFORDSHIRE

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Abstract

This article aims to explore the extent to which technology can help to facilitate an effective personal tutoring framework to support international students. Although the need for online technology has recently surged due to the global COVID-19 pandemic, current provisions for online learning are staff-centred and geared towards the delivery of academic teaching materials rather than features to enable the continuation of effective personal tutoring remotely. This article presents existing literature regarding relevant definitions and models of personal tutoring before also considering the specific challenges that international students and their personal tutors face. A discussion then sets out to identify the gaps in existing technology in addition to suggestions for a new technological solution to address these issues. The article considers potential benefits and specific considerations, which could lead to improved student retention, attainment, personal development and employability. Higher level impacts could also include increased international reputation of the university, strengthening of the international student community and commitment to fulfilling the University of Hertfordshire's 2020-25 strategic plan to empower students from all backgrounds, no matter where they are from, to succeed.

Introduction

The use of technology to support students' teaching and learning in higher education is a common phenomenon (Amador, 2014). Traditionally, the concept was introduced and developed to provide students with academic support. However, due to its widespread popularity among university students and ability to reduce cost, time, and improve feasibility of delivering teaching, higher education institutions have significantly increased the use of technology in recent years (Junco, 2010; Junco & Cole-Avent, 2008; Montag et al., 2012). Technology has evolved so much and can be used in many different forms to support students. Key benefits of technology include distance support, less time constraints, cost-effectiveness, easy accessibility, and not being constrained by staff availability (Multari, 2004).

The demand for online teaching has recently surged due to the global COVID-19 pandemic which has fundamentally altered the higher education landscape across the world. Technology has suddenly been reclassified from 'merely helpful' to 'absolutely essential' in

the struggle to continue students' education in all universities. Although international students have faced many additional challenges which have emphasised the need for extra pastoral and academic support from their personal tutors, existing technology is tailored towards teacher-centred provisions for academic teaching and learning, as opposed to providing important functionality to facilitate the continuation of effective but remote personal tutoring sessions. This article focuses on how technology can be used to provide an effective solution for personal tutoring of international students not only through the current coronavirus pandemic, but also for the future of the higher education sector.

AIMS & OBJECTIVES

The aim of this paper is threefold: firstly, it considers the existing definitions and models of personal tutoring. Secondly, it will critically analyse the challenges that personal tutors and their international students face in engaging in effective sessions. Finally, the paper will address how a new technological solution could help to overcome such challenges and provide improved support for international students. The objective of this paper is to address the growing demand to further stimulate discussion surrounding personal tutoring frameworks whilst considering some key gaps in the current literature, promoting a new technological platform to support international students.

RESEARCH QUESTION

How can technology be improved to facilitate and improve personal tutoring for international students.

LITERATURE REVIEW

Definition and Theoretical Development of Personal Tutoring

Although there is no set definition of the role of a personal tutor (Mynott, 2016), a common practice definition is academics who provide holistic guidance to students on both an academic and personal level. The term 'personal tutor' is not universal and has many different terminologies including pastoral tutor, academic tutor, learning support, academic support tutor mentor, and guide (Atkinson, 2014). While the terms 'personal tutor' and 'academic support tutor' are the most common in UK higher education, institutions in America, Canada and Australia more frequently use the term of 'academic advisor' (NACADA, 2017; Morey and Robbins, 2011). The objective and scope of the academic advising role is conceptualised by the NACADA Global Community for Academic Advising (NACADA, 2017). The core values and core competencies of the concept of academic advising, and the roles of academic advisor and personal tutor are the same (Grey and Lothie, 2016).

The term 'personal tutoring' emerged from the Latin term 'in loco parentis' moral tutor system first used at the universities of Oxford and Cambridge in the sixteenth century

(Earwaker, 1992). Due to its historical importance, it is argued that the personal tutor role can have a wider scope than that suggested by NACADA. Although the Council for the Advancement of Standards in Higher Education defines a national standard for the role of academic advisor, there is no such standard for personal tutoring as defined by the regulatory bodies governing higher education in the UK.

(Earwaker, 1992) introduced three main pillars of personal tutoring in an 'integrated model and infrastructural approach'. This model suggests that the role of a personal tutor should include pastoral, professional and curriculum support. Pastoral support includes personal support for students, while the professional pillar highlights staff training, and the curriculum pillar focuses on including group tutoring sessions into the formal curriculum (Figure 1).

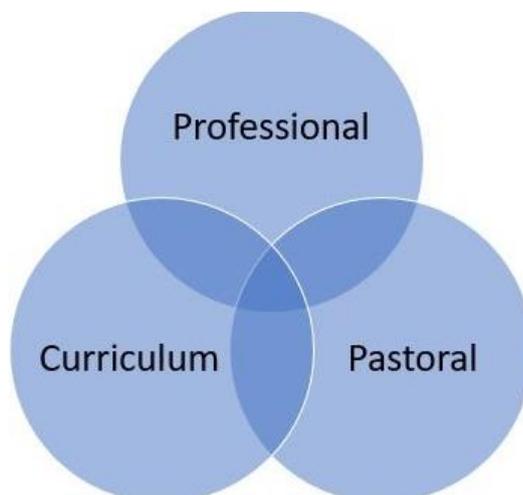


Figure 1. An 'integrated model and infrastructural approach' (Earwaker, 1992)

The proactive personal academic support tutoring (PAT) model was designed by (Laycock, 2009) to support first-year university students. In this model, Laycock included the key principles of promoting social belonging and identity development. This was vital given that numerous subsequent studies found that a lack of 'sense of belonging' in students is a fundamental reason for an attainment gap. This model is considered to be the traditional style of PAT which has been adopted by most universities in the UK (Figure 2).

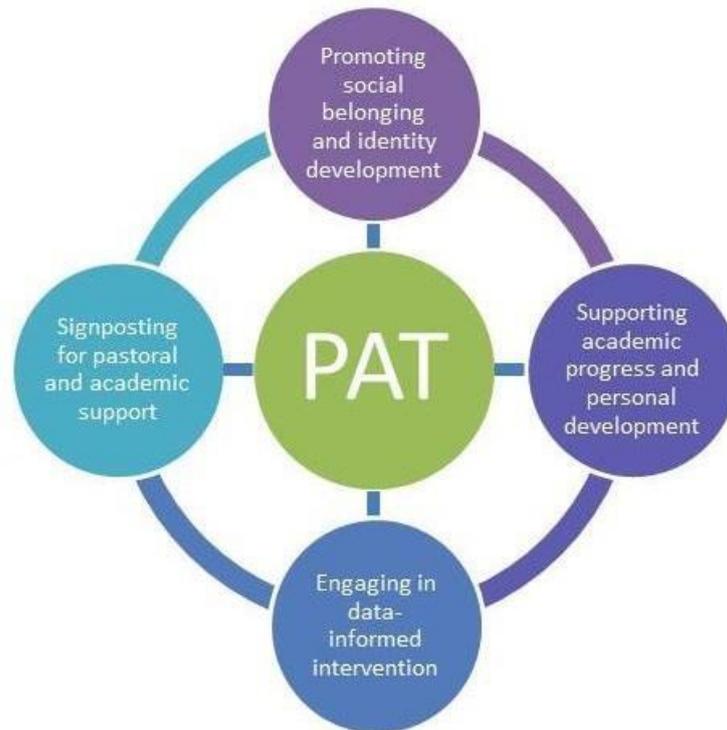


Figure 2. Proactive PAT (Laycock, 2009, p. 23).

(Thomas, 2012) conducted a highly influential study to investigate key characteristics which best enable successful personal tutoring in higher education. His findings suggest that successful personal tutoring will include principles of:

- Being the first point of contact for students to obtain information about university procedures and expectations
- Supporting students' academic development and providing feedback
- Providing pastoral and welfare support
- Enhancing employability
- Increasing students' sense of belonging

Thomas further suggests that following these principles, regardless of the students' demographic background, will increase their retention and attainment. Other models suggest coaching and mentoring approaches can be beneficial too. (McClellan et al. 2013; Wootton 2007).

(McIntosh, 2019) is the current leading scholar in this field who observed previous tutoring models over the years and developed an advanced personal tutoring model for all students

at all university levels. McIntosh introduced a student focused compassionate-based blended set of principles for personal tutoring which are student centred, inclusive, personalised and developmental (Figure 3).

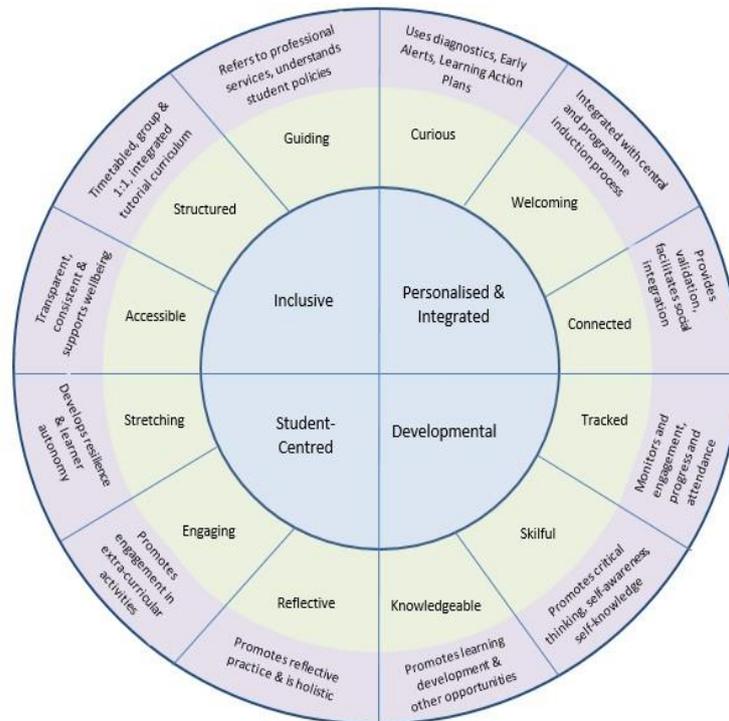


Figure 3. Tutoring Principles (McIntosh, 2019)

Personal Tutoring for International Students

The University of Hertfordshire (UH) is home to more than 3,800 international students from 100 different countries. It is important for personal tutors to be made aware of the specific challenges their international students are most struggling with because personal tutors are vital providers of both academic and pastoral support for students (Yale, 2017). Personal tutors have been shown to provide an important conduit between students, their studies and the wider university support framework whilst also cultivating students' sense of belonging which is crucial for their engagement (York and Longden, 2004). A study by (Russell, 2008) found that the number of students who sought support from their personal tutors was higher than the number who accessed centralised counselling services, indicating the great importance of effective personal tutoring.

Existing literature has identified several key factors that need to be considered to ensure effective personal tutoring for international students. Key researchers in this field, (Welikala and Watkins, 2008), interviewed 40 international postgraduate students regarding their experiences of learning in the UK. A particularly pertinent finding was that many of the international students believed that it is the tutor's place to speak and that students should

therefore refrain from asking questions. It was further found that tutors often made the assumption that 'quiet' and 'shy' students were either not engaged or did not understand, when the students were in fact thinking very deeply about the subject with maximum attention. In many cultures, a formal classroom setting is considered to be an inappropriate environment for students to ask questions. For such students, effective one-to-one personal tutoring resolves the problem of them feeling unable to ask questions in front of a larger group. Welikala and Watkins, (2008) recommend that tutors could help their students to feel much more valued and respected by simply allowing them extra time to formulate their thoughts before they are expected to respond. A similar study by McDonald, (2014) identified the same factor that international students were highly unlikely to question their lecturers and personal tutors.

Lochtie, (2016) conducted an important study to compare personal tutoring of international students in the UK with 'academic advising' in the USA. Findings indicated that international students would like tutors to be more 'willing to go the extra mile' in reaching out to them by initiating contact and offering support, practical information and advice to help them overcome the culture shock of moving to study in the UK. A study by UKCISA (2018) found that Chinese students stated a preference for their tutors to be more proactive. There is, however, some contrasting literature regarding the potential 'dangers' of being too helpful towards international students, which may in fact perpetuate, rather than resolve, their struggle to become independent learners (Bartram, 2009). Earwaker, (1992) refers to this phenomenon as a "paradox" of helping, for which personal tutors therefore need to strike a balance between assisting students to feel more comfortable and supported whilst also encouraging their autonomy.

It is also important to note that the dynamics of a personal tutoring relationship between tutors and international students may be different when compared with tutors and home students. Wheeler and Birtle, (1993) found that international students regard their personal tutor as being a person in authority with whom they should maintain a respectful rather than personal distance. McDonald (2014) affirms that, due to this dynamic, international student are more likely than home students to miss out on important support during their university experience in the UK.

More alarmingly, the recent UKCISA (2018) study regarding Chinese students' perceptions of personal tutoring, found that the students did not understand the purpose of sessions with a personal tutor. It is important to note, however, that this study did not compare its results with home students who may also report experiencing the same issues.

A recent study by Raby, (2020) found that many international students reported a preference to contact their family and friends, often in their home country, rather than speaking with their tutor about personal issues. Interestingly, the students did however state that they were happy to contact their tutor regarding academic issues. Some students stated that they felt well supported by their tutors who were willing to assist them with

English language difficulties such as grammar and spelling whilst also communicating in, “easy to understand language”.

A particularly notable finding was that students found bespoke tutorials about transitioning into study in another culture incredibly beneficial. These results support previous study findings that increased intercultural support would be valuable (Lochtie, 2016) and should continue to be provided beyond induction (Leask and Carroll, 2011).

The BAME Attainment Gap

Personal tutoring at the University of Hertfordshire is heavily focussed on attainment of BAME students and those from a low socio-economic background. Most of the BAME students at UH are also international students, making the objective to reduce the BAME attainment gap particularly relevant to this article. The attainment gap at UH is currently 21%, which is significantly higher than the national average of 13%. Fostering a ‘sense of belonging’ between students and their university through a successful tutor-tutee relationship has been shown to be one of the most important factors to reduce feelings of isolation and reduce the BAME attainment gap (Basi et al., 2019). In addition to that, discussing potential barriers to learning can help students to anticipate and access support early which will may help to reduce the gap. Conversations between students and personal tutors can also support students to seek out extra-curricular opportunities and support from university services (such as the wellbeing team) to support their personal development and physical and mental health and wellbeing. Through improving the communication between international students and their personal tutors and providing a ‘one-stop-shop’ for key information that students might need, a new technological solution may help to reduce the BAME attainment gap in several different ways.

Impact of the COVID-19 Pandemic

International students have been particularly affected by COVID-19 because they face additional challenges compared with home students, including access to Internet and time-zone differences in their home countries, increased feelings of isolation and worries about health, travel and visas (Fishbane and Tomer, 2020).

The pandemic has not only had a profound impact on students, but also on their personal tutors who have been trying their best to keep up with rapidly changing restrictions and restructuring of teaching and learning methods at the university. A substantial challenge is the amount of additional pressure personal tutors have been subjected to through the almost ‘overnight’ switch to online learning, significant changes to learning and teaching methods at the university, restricted access to in-person facilities on campus and uncertainties regarding how to answer students’ questions about such a rapidly changing situation with far-reaching consequences. Higher education had already been described as an ‘anxiety machine’ for academic staff with excessive workloads (Morrish, 2019), meaning

that an innovative solution to reduce the pressure on personal tutors whilst still providing increased support for their international students is of utmost importance.

Although the COVID-19 pandemic has greatly accelerated the need for online teaching and learning in order for students to continue their education at university, making the switch to online has raised many problems and concerns for both students and their personal tutors. There had already been various discussions regarding how the move towards fully online teaching will affect pedagogy, through which it had become clear that a “one size fits all” approach regarding suitability and compatibility of certain online formats for students is not appropriate (Gillett-Swan, 2017). (Mackintosh, 2019) stated that personal tutoring is a key force for change because the impact of COVID-19 on the higher education sector has already been severe with a vastly increased likelihood of greater educational inequalities.

Many international students have been unable to travel between their home country and the UK due to COVID-19 travel restrictions, creating potential problems for their student visa status which states a maximum limit for the number of days spent outside of the UK. Restrictions regarding physical access to the UH campus and attending in-person meetings and classes have been unavoidably chaotic, causing confusion and worry for international students who feel they do not have sufficient information to make informed decisions about how or when they should attend. Problems with accessing online lessons and assignments from abroad because of factors such as time zone differences and lack of Internet availability has led to a significant drop in student engagement.

The pandemic has created a lot of additional stress for international students and a recent QS International Student Survey (2020) found that 43% of international students reported struggling with their mental health and increased feelings of social isolation. Personal tutors have reported that, despite their best efforts, they have been unable to maintain sufficient contact with some of their international students because of such issues, and that many of these students have reported feeling confused about how to find the information, resources and support they need to continue their studies. Many personal tutors have faced additional pressures in their own personal lives because of COVID-19, such as balancing childcare with working from home and trying to meet increasing demands in a smaller number of available hours. These are just some examples of the concerns that have been raised so far by international students and their personal tutors, which would be important to consider as part of a new personal tutoring platform.

DISCUSSION

It is interesting to observe that academics have been working hard over the years to develop an effective personal tutoring model and literature shows that, although a number of models are available, personal tutoring for international students has been largely ignored. There is currently no academic literature that focuses on personal tutoring for international students using technology. This article is the first to address how technology

could be used as an ideal platform to facilitate a beneficial and effective personal tutoring support system for international students.

Existing Technology

The University of Hertfordshire currently provides access to the ‘Canvas’ Learning Management System (LMS). Canvas is becoming increasingly popular as the LMS of choice for universities both in the UK and globally, as it provides key features for high quality teaching and learning. Example features include the ability to create module specific pages and content, inclusion of various types of media (such as videos, images, slides, documents and web links), announcements, interactive activities such as discussions and quizzes, submission of coursework and summary of grades. Figures 4 and 5 show the popularity of Canvas and other LMS platforms in UK and other global universities (Edutechnica, 2020).

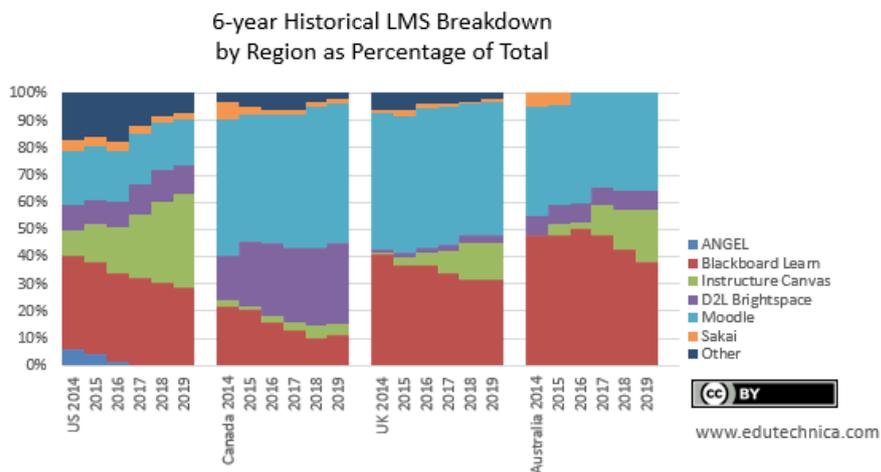


Figure 4. Historical market share LMS data for global universities (Edutechnica, 2020)

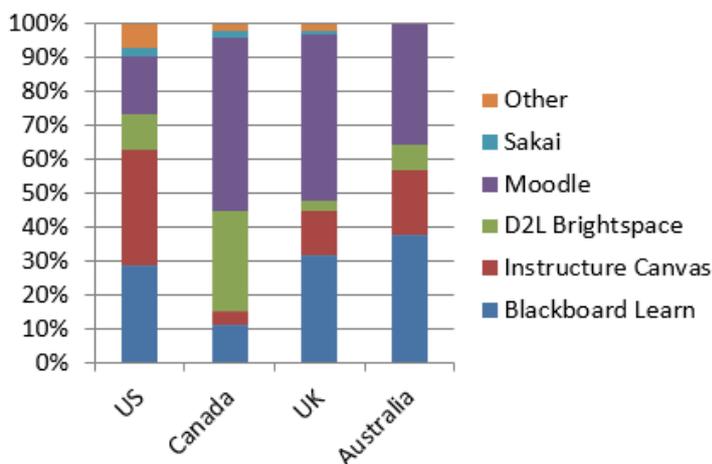


Figure 5. A spring 2020 global snapshot of LMS market shares (Edutechnica, 2020)

The University of Hertfordshire also has a subscription to Microsoft Office 365, giving both staff and students access to MS Teams (and other software) for online meetings and email communications. However, despite the many features made available in both Canvas and MS Office for online teaching and learning, they have been primarily designed for academic purposes rather than the delivery of online personal tutoring, which has remained as a largely in-person provision until recent COVID-19 restrictions. Canvas is teacher-centred in its approach which largely only allows academic staff to upload teaching and learning materials, as opposed to encouraging vital co-collaboration with students. Table 1 sets out examples of features which Canvas has limited or no provision of facilities for.

Table 1. Example features which Canvas has limited or no provision of.

1.	Multi-language
2.	Anonymous discussion boards
3.	24/7 chat service (for student to access from different time zones)
4.	Sharing stories and featuring role models
5.	Peer support and group collaboration
6.	General information for transitioning to UK study e.g. maps, directions and information for public transport and local shops
7.	Combining different 'types' of students e.g. undergraduate and postgraduates

Proposing a New Technological Solution

This article proposes that the development of a new, innovative and student-centred technological solution could greatly assist with many of the problems outlined above to provide international students with the time and pressure on the staff involved. Higher level objectives of such a solution would be to promote retention of international students, improve their attainment to reduce the existing BAME attainment gap and provide a practical method for the University of Hertfordshire extra care that they need from their personal tutors whilst simultaneously reducing the (UH) to continue fulfilling its strategic plan, despite the ongoing pandemic.

The main priority of a technological solution should always be to improve the communication between international students and their personal tutors whilst providing

key information and resources in one easily accessible place. In order to ensure this, Table 2 shows some example features which the new technological solution could include.

Table 2. Example features for a new technological solution to support international students.

Feature	Problem This Solves	Benefits
Multilingual content	Fear of contacting tutors due to English language concerns; Misunderstanding important information	Improves transition to studying in the UK and improves students' sense of belonging
Student-led blog	Feeling disconnected from other students; role model representation of own culture	Inspiring students; peer learning; increasing empathy towards self and others
Anonymous forum (discussion threads)	Non-participation of quiet and/or shy students	Improved confidence; learning through noticing others; group collaboration
24/7 live chat (operated on a rota system between both staff and student peers)	Many students are currently forced to study from their home countries, in differing time zones	Flexible, quick and effective method of communication which improves student accessibility and access to vital/urgent/specific information

Potential Impact

The University of Hertfordshire recently announced their strategic plan for 2020-2025, which is largely focussed on students' empowerment, stating that, "our vision is to transform lives. This means whatever your background, wherever you are from, we will drive your potential, powering you to succeed" (UH Strategic Plan 2020-2025). Key strategic themes include 'offering opportunity' and 'building community' as the university is committed to supporting students in preparation for global opportunities after graduation whilst also building their network with others to create a positive impact on the wider international society and community. An innovative technological solution could help the

university to continue fulfilling its strategic plan to empower students from all backgrounds, no matter where they are from. Such a solution would help to ‘embrace flexibility’ and ‘provide high-quality and distinctive education that transforms lives’ in response to an ever-changing situation.

This article focuses on providing a long-term and scalable solution for personal tutors and international students at UH but, once tested, could also provide a structure for the higher education sector in general. It has a great potential for expansion and inclusion of contemporary issues and updates in addition to creating an ever-growing positive international student community.

Other Considerations

In view of the specific challenges that international students and their personal tutors face, several studies recommend that staff training is required to understand cultural differences and respond appropriately (McDonald, 2014); (Lochtie, 2016); (McFarlane, 2016). Although staff training and the development of a new technological platform would involve setup and ongoing costs, the benefits may significantly impact retention of students in addition to promoting reputation of the university, increasing recruitment of students and strengthening the international student community.

Other important considerations include security and data protection, maintenance, updates and moderation of the technological platform, particularly in the cases where students may engage in discussion threads or upload media content. It is also important to consider accessibility and note that some international students are already struggling to access the technology (such as a computer, mobile device or stable internet connection) required to participate (Fishbane and Tomer, 2020; (Herpich, 2020); (Karkar-Esperat, 2018); (Herpich, 2020).

Recommendations

The author suggests that the best way to establish and prioritise features for inclusion in a new technological solution would be to conduct a formal research study at the University of Hertfordshire. Such a study could, for example, make use of qualitative interviews with both international students and their personal tutors to discuss their current concerns regarding existing personal tutoring sessions and identify which features they feel may be most beneficial towards resolving these concerns. These results could be compared against a review of features currently available via Canvas, MS Office (and others, in order to guide the next steps.

CONCLUSION

The development of a new technological platform for international students to communicate with each other and their tutors, would help to establish a stronger

community and improve accessibility to information they need. It would also provide the ability for tutors to monitor their engagement and encourage peer learning, group discussion and collaborative learning. By using technology to support a large cohort of international students, the creation of a holistic technological solution for personal tutoring would help to ensure an excellent student experience whilst empowering students to become more independent and familiar with the technology that they will need for their studies and future career. Such a solution could be crucial in helping international students in their transition from education in their home country to the UK, improving higher level objectives for the University of Hertfordshire such as student retention, attainment, employability and meeting its 2020-25 strategic plan.

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Teaching considerations for implementing a flipped classroom approach in postgraduate studies: the case of MBA

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Abstract

Higher education is increasing its focus on delivering student centred learning which can be achieved through the flipped classroom. As a teaching practice, the flipped classroom provides lecture material online pre-class, and then utilises the class time to facilitate higher level learning. Achievement of higher-level learning has, however, been shown to be to the level of academic study and the subject area. Therefore, further application of the flipped classroom practice in a variety of academic study levels and subject areas will aid the establishment of 'best practice'. This paper will use a systematic literature review to (1) draw conclusions on the effectiveness of the flipped classroom in postgraduate settings, and (2) provide guidance on the establishment of 'best practice' for the Master of Business Administration (MBA). Review of the literature revealed 12 publications within past three years on MBA flipped classrooms, this demonstrates limited research on flipped classrooms in MBA courses. Results showed increased student satisfaction in flipped classrooms and some evidence of improvement performance, but more research was needed. Any advantages of the flipped classroom can only be achieved if the assessment and content (inside and outside the classroom) are aligned. Furthermore, an emphasis on active learning is important which can be achieved through real world problem solving and peer-to-peer learning.

Background

Rise of technology enhanced teaching

Over the last decade, there has been a notable digital paradigm shift with the inclusion of digital content to supplement the traditional teaching model in Higher Education Institutions (HEIs). Commonly understood as blended learning, teachers would incorporate digital content (e.g., videos, games, digital libraries, and other online content) to enhance the traditional classroom experience (Ahmed 2016). Such practices have facilitated a greater degree of customisation, to provide more relevant and flexible content to enhance the student learning experience overall (Howitt & Pegrum 2015). Despite this potential, if merely embedding digital content into traditional teaching delivery methods, the increased technology adoption will only result in marginal benefits (Mallik 2019). Students are still passive learners in the classroom (Cundell & Sheepy 2018) and will therefore need

encouragement and support to engage with this new type of content delivery. One instructional innovation to arise from the blending learning environment that attempts to change this is the flipped classroom (or inverted classroom) (Prashar 2015). The success of the flipped classroom is the realisation that the traditional teaching model is not always sufficient, particularly at the higher levels of study (Mallik 2019).

Flipped Classrooms

The premise behind the flipped classroom is to maximise the use of class time (Mallik 2019). This involves the use of technology to ‘flip’ the delivery; that is, the repositioning of the traditional lecture material to outside of the classroom would facilitate more class time for higher-level learning (Lundin et al 2018). The difference between traditional and flipped teaching is elegantly illustrated by Ahmed (2016) in Figure 1, who overlaid Bloom’s Taxonomy with both teaching models. Within the traditional teaching model, class time is used to introduce new content (lower levels of learning) with homework done outside the classroom (higher level learning). The flipped classroom, however, reverses this by introducing new content outside the classroom and leaving the class time for higher level learning (Prashar 2015).

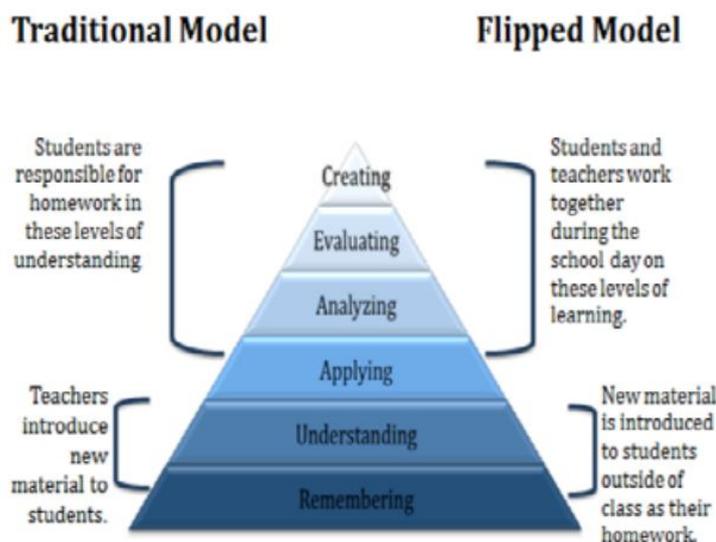


Figure 1: Bloom’s Taxonomy related to traditional and flipped teaching

Source (Ahmed 2016)

A student’s first experience with new content, therefore, is now not only outside of the classroom but also via electronic delivery (e.g., videos, readings etc.). This means that students can come to the classroom already familiar with the content (pretraining effect), so that the teacher can use the class time to engage them in higher levels of learning (Muller & Wulf 2020). This way of teaching has the benefit of more personalised contact with the teacher, and within a class time discussion setting, as opposed to a lecture hall (Mallik

2019). Another advantage of dedicating class time to higher-level learning is that students are more likely to create active learners who are engaged with and absorbing the content (Li & Pinto-Powell 2017).

Changing roles of the teacher and student

When a flipped classroom is adopted, the role of the teacher and student changes. The teacher moves from the centre of the classroom – from being the instructor – towards the periphery of the classroom – to become a facilitator of student-centred learning (Admed 2016). This requires the teacher to devise a clear structure for their students' learning, with emphasis on the linkages between the out-of-class and in-class learning materials and content (Dutta et al, 2019). To gain the most out of this student-centred learning approach, clear expectations need to be set for the students to establish good study habits (Avolio et al, 2019); the intention of a flipped classroom is to allow students to take control of their own learning (Admed 2016). Howitt and Pegrum (2015) warned that teachers who desire to convert from traditional to flipped classrooms should avoid perpetuating bad teaching habits. Pre-recorded (out-of-class) content needs to be granular by using bite size lecture recordings (which could be audio-only or audio-visual) and follow-on activities (in-classroom) that facilitate a deeper learning.

For the student, a flipped classroom approach sees their learning model flipped on its axis, with the preparation before the class becoming very important (Admed 2016). It is necessary for students to follow the clear structure set by their teacher to prepare before the in-class learning. Then, after the in-class learning, students need to demonstrate further discipline after the class by reflecting on what they had learnt (Avolio et al, 2019). If implemented effectively, this type of teaching approach will encourage more independent students (Howitt & Pegrum 2015). Howitt and Pegrum (2015) warned, however, that given the focus on technology for the out-of-class content, students will need adequate tools and training to access all the learning material.

Aim and objectives

As established in the discussions above, what constitutes higher-level learning is dependent on the level of study and in some cases the study area (Mallik 2019). The aim of this paper is to conduct a systematic literature review to catalogue and evaluate the current flipped classroom teaching practices with specific attention to the Master of Business Administration (MBA) programme at the University of Hertfordshire (UoH). The MBA programme is at the postgraduate level (Level 7) and serves to enable students to “develop the critical and reflective strategic leadership skills [they] need to succeed in an uncertain work, challenging [their] assumptions, cultivating flexible thinking, effective decision making and responsible management” (UoH 2020 <https://www.herts.ac.uk/courses/postgraduate-masters/master-of-business-administration2>). It is important to further distinguish that the focus of the paper will be on the traditional MBA programme not the more recent MBA

(degree apprenticeship) programme. Specifically, the two objectives of this paper are therefore:

1. To determine the effectiveness of a flipped classroom teaching approach at the postgraduate level; and,
2. To provide 'best practice' recommendations for implementing a flipped classroom teaching approach in the MBA at the UoH.

Methods

To achieve the research objectives, a systematic literature review was conducted. This method could assist to fill the void of knowledge in MBA teaching practice. Lundin et al. (2018) further suggest that there is a "need to develop systematic knowledge around flipped classrooms" (p.4), and that a "systematic review should be of use for practitioners, scholars, and stakeholders" (p.4).

For transparency, this paper followed Lundin et al.'s (2018) procedure for conducting a systematic literature review which involves nine tasks. These tasks can be divided into two categories: collecting the literature and analysing the literature. The first category of collecting the literature involves five stages: (1) establishing the review question(s), (2) creating inclusion criteria, (3) define the research strategy, (4) applying criteria to the literature, (5) mapping the review process. This section of the paper describes the application of these stages in the current project on MBA practice. The second category of analysing the literature involves four further stages: (6) gathering descriptive data, (7) reviewing the relevance/ quality of the remaining publications, (8) synthesising the contributions of the remaining publications, and (9) applying the remaining publication. The next section of the paper describes these stages with respect to the current project.

Collecting the literature

In the first stage, two review questions were established to align with the purpose of the paper (as previously set out). These were:

- What is the effectiveness of a flipped classroom model in MBA programmes?
- What are the MBA-specific teaching practices that improve student outcomes?

The term 'effectiveness' refers to the ability to improve student outcomes compared to the traditional classroom model. These student outcomes can be improvements in grades, attendance, or satisfaction, as well as positive changes in the students' opinions of the programme and/or teacher.

In the second stage, two inclusion criteria were developed to prepare for the data (literature collection). Firstly, only literature published from 2017 onward were to be included.

Considering the rapid advances in technology (Schlegelmilch & Bodo 2020), finding best practice for flipped classrooms which is reliant on technology for delivery should be focused on newer publications. Secondly, only literature discussing MBA flipped classrooms were to be included. As mentioned by Mallik (2019) maximising class time will depend on the level of study so to have relevant teaching practices, only MBA flipped classrooms should be considered.

In the third stage, having set the inclusion criteria, the actual literature database was decided. The UoH's online library was selected because UoH staff and students have unlimited access to all of the literature housed within the library. Part of the research strategy was to restrict the literature database on two accounts. (1) Only those publications written in English to ensure comparability between the findings. (2) Only those publications that were identified as research papers, conference proceedings and reports. This was to ensure that the information drawn upon for the current study had been through the peer-review process (excludes student dissertations for example), with reports and conference papers included to capture wider dissemination of teaching practice. The search was conducted in November 2020.

In the fourth stage, 'MBA flipped classroom' was entered as the search term into the UoH online library, with the search conducted in November 2020. To apply the first criteria, an automatic time filter was selected from 1st January 2017 to 10th November 2020. This resulted in 123 publications to review. To apply the second criteria, a manual word search was performed on the main text of the publication; the words utilised were 'flipped' or 'inverted' in addition to 'MBA', 'executive', 'master(s)'. If a publication had the words 'executive' and 'master(s)', the publication was reviewed in more detail with final inclusion based on whether the context of the paper was MBA specific. This resulted in 12 publications to review. Appendix 1 contains the full listing of the 12 publications, which will subsequently be discussed.

Please refer to Figure 2 which depicts the initial database search results and subsequent results from the application of the two inclusion criteria (demonstrates stage 5).



Figure 2: Flow chart of review process

Analysing the literature

Following Lundin et al.'s (2018) procedure for conducting a systematic literature review, this study will now present the findings for the stages of the second category, analysing the literature:

- Stage 6 – gathering descriptive data
- Stage 7 – reviewing the relevance / quality of the remaining publications
- Stage 8 – synthesising the contributions of the remaining publications and Stage 9 – applying the remaining publications.

Descriptive profile of the literature

The results of the systematic literature review show congruence with recent studies; that is, limited application of the flipped classroom was found in postgraduate courses and even less in MBA courses (Swart & MacLeod 2020; Scafuto et al, 2017). Lundin et al. (2018) who performed a systematic literature review on flipped classroom literature for all disciplines found that the majority of the papers were in education and education technology and focused on higher education. Of the 12 publications identified for this study, five were focused on education and education technology in MBA courses (or MBA was at least part of the higher education discussion). The remaining seven publications were evaluations of student performance in flipped classrooms. These evaluations occurred across students of different disciplinary backgrounds; Business Analytics (Swart & MacLeod 2020); Dentistry (Roberts et al, 2020); Medicine (Li 2017); Management Science and Management Information Systems (Wengrowicz et al, 2018); and Operational Management (Bayley & Hurst 2018; Klotz & Wright 2017). This implies that although there is research at the higher education level, this has not really extended into postgraduate. Furthermore, there was limited dispersal to other disciplines.

Contributions of the literature

MBA courses and considerations for implementing flipped classrooms

Despite the limited amount of research, there is agreement that the implications of flipped classrooms differ for MBA courses compared to other levels of study. Scafuto et al (2017) offer one explanation in that the MBA market is an 'experience-quality service market'. This implies certain expectations around the delivery (experience) and scope (content) of the course. For students, there needs to be extensive linkages between the content and real-life situations (Scafuto et al. 2017), and a degree of flexibility when accessing content due to concurrent employment arrangements (Cundell & Sheepy 2018). Teachers, furthermore, have the expectation that students are more independent, with self-discipline and good time management. This is reflected in different teaching formats, typically involving necessary student preparation before class (Avolio et al, 2019). Avolio et al. (2019) also suggest that the work experience of the students provides a unique opportunity where an

exchange of experiences amongst the students can provide a much richer learning environment.

Given these expectations, a flipped classroom approach seems apt for MBA courses. MBA students are already accustomed to pre-lecture preparation. Therefore, the premise of accessing learning material online and pre-class would be suitable to these students and their employment commitments. Furthermore, through students sharing their employment experiences – with the teacher highlighting the connections to the pre-class material and thus linking theory to practice – higher-level learning could be achieved. Overall, an MBA course is typically seen as more advantageous to other post-graduate courses, with a degree of prestige, which could be facilitated through a flipped classroom approach.

Effectiveness of a flipped classroom approach for MBA courses

The effectiveness of flipped classrooms is measured using student satisfaction and/or student achievement. Across the seven publications that evaluated student performance, all agreed that student satisfaction improved in flipped classrooms compared to traditional classrooms. Increases in satisfaction were accompanied by higher perceived quality of the content and teacher (Scafuto et al, 2017). The benefits of flipped classrooms were present regardless of whether the face-to-face classes were online or in a classroom (Swart & MacLeod 2020; Wengrowicz et al, 2018).

In regard to student achievement, the majority of the seven publications found positive associations with flipped classroom. For instance, Swart & MacLeod (2020) and Klotz & Wright (2017) observed increases in student grades, whereas Bayley & Hurst (2018) reported increased student understanding of the topic, and Roberts et al (2020) found students were more prepared for the real world. Li & Pinto-Powell (2017), however, found the link between flipped classrooms and student achievement to be inconclusive. This supports the viewpoint of Muller & Wulf (2020) who conducted a literature review on technology enhanced teaching practices and highlighted that currently there was not enough research to gauge the effectiveness of flipped classrooms on MBA student learning.

An important consideration when measuring the effectiveness of flipped classrooms is the idea of 'active learning'. Flipped classrooms are designed to facilitate deeper learning during face-to-face classes; this is achieved by creating an active learning environment. On the surface, student achievement is linked to teacher competency, especially technological competency (Muller & Wulf 2020) and communication effectiveness (Wengrowicz et al. 2018). Whilst this is indeed true, considerable effort is required from the teacher in not only planning the face-to-face activities, but also in aligning these activities to the online, pre-class content. In flipped classrooms, however, the teacher should only ever be the facilitator; it is the students that must drive their own learning. Wengrowicz et al (2018) suggest that peer-to-peer communication was the most important factor for student achievement. Li & Pinto-Powell (2017) agree by highlighting that the focus should be on a

teaching format which includes engaging and interactive classes to achieve active learning; they believe that the more students that interact, the more effective the learning will become.

Recommended teaching practice for MBA courses (in using a flipped classroom approach)

Collectively, the 12 papers highlighted that the MBA student cohort is in the best position to benefit from a flipped classroom approach. The following section will therefore consider the practices that were identified as most effective for MBA teaching by flipped classrooms. It is recognised, however, that this guidance could be broadly applied to flipped classrooms across different subjects.

With respect to delivery, both the online content and face-to-face (in classroom) content have different roles to play. Allen (2020) suggests that both the teacher and student need to have technological competence for pre-class activities; the teacher is the facilitator of the learning and therefore must design and 'publish' the content in an accessible manner, whereas the student needs to commit to accessing it in the way that it was designed. Several studies also advocated for more active forms of learning. Cundell & Sheepy (2018) found that passive online activities were not as effective; students preferred a 50/50 split between online and face-to-face activities. Furthermore, Muller & Wulf (2020) advocate that it is likely to be the high achieving students who will benefit most from self-learning, and therefore, learning activities should focus on interactions between student and teacher in the classroom (Dutta et al, 2019) and amongst students in both the classroom and online (Cundell & Sheepy 2018). The opportunity for off-site meetings with students is also recommended (Allen 2020).

Secondly, when considering the content, there appears to be a more diverse array of effective teaching practice. On one level, Dutta et al (2019) promotes the value of the teacher's role in creating content with Muller & Wulf (2020) suggesting that the content needs to be relevant to the background of the students. The most important aspect of course design, however, is the alignment of content; the pre-recorded materials, in class activities and assessment need to be linked and feedback off each other (Muller & Wulf 2020). Classes need to be planned around the millennial/postmillennial student, who is interested in experiential learning, having timely feedback, and thinking outside the box (Dutta et al. 2019). Furthermore, the in-class activities should provide opportunities for learning about realistic business situations where students must create solutions themselves (Wengrowicz et al 2018). When planning the assessment, it is important to make it diverse (Dutta et al, 2019). Cundell & Sheepy (2018) found that those assessments where students had to collaborate were the highest graded pieces, and Dutta et al (2019) suggest assessment that creates experiential learning through technology and group activities. Overall, the course content (and its assessment) should reflect student centred learning (Muller 2020).

Conclusions and Reflections

This paper aimed to determine the effectiveness of a flipped classroom approach in postgraduate teaching practice and to provide 'best practice' for MBA courses specifically. The systematic literature review revealed that limited studies have been conducted on MBA flipped classroom teaching; between 2017 and 2020, there were only 12 publications available in the University of Hertfordshire's Online Library. In my opinion, the recommendations provided were a bit broad and could apply to any flipped classroom. This may imply that best practice for MBA is the same as any flipped classrooms, however, more research is needed to make this determination. Regardless, I can draw some insight from these recommendations – which can be categorised into (1) delivery and (2) content recommendations – and make modifications in my teaching to suit.

Flipped classrooms were effective at increasing student satisfaction and there was evidence of increased student achievement, however, more research is needed. All things considered, flipped classrooms should be well suited to MBA courses because students are accustomed to do the pre-class preparation and their work experience would enrich the face-to-face classes. Delivery revolves around technology competency; the teacher needs to provide accessible content and the students need to be able to access it. When constructing the Canvas module site, I have paid attention to the accessibility of content and flagging where it is and when to access it. All asynchronous materials – recordings and preparatory activities were made available on Canvas with similar formats, layouts, and links with other content. These materials were made available four weeks before the in-class activities to provide plenty of lead time.

Students commented that accessibility and layout of content was good, however, the lead time between the asynchronous materials and in-class activities was too long. Some students would review the content during the week of release and lose some of that knowledge over the four weeks before the in-class activity. Given the student feedback I am hesitant to reduce the lead time of asynchronous materials, however, will highlight this issue so students can make a more informed decision when they access the asynchronous materials.

An overall recommendation for implementing a flipped classroom was that the content needs to be tailored to the students' background to keep it relevant. In reflecting upon my own teaching practice, I felt that none of these 12 publications evaluated MBA student cohorts that matched my students' backgrounds or module content. The students in my module mostly come from the public sector, especially the NHS so it is important that real world examples and discussions revolve around public sector issues. All guest speakers were advised to use public sector and specifically NHS examples where possible and given the public sector decisions around Covid-19 they found no shortage of recent examples. Students found these examples very engaging, and the subsequent in-depth discussions

were enlightening. Furthermore, it is important that the pre-recorded materials, in-class activities, and assessment are aligned, and that active learning can be achieved.

For instance, with my module on Collaborative Governance, my knowledge is formed based on an academic and research perspective, not necessarily from relevant real-world business contexts (particularly for the UK). Therefore, I have prepared the pre-class learning in terms of academic foundations but have invited guest speakers (both academic and industry professionals) to deliver the 'real-world' content. Using their own experiences / knowledge, they can provide the real-world activities for active learning, through introducing cases of collaborations in their pre-recorded material and then using groups in the classroom to solve real-world problems for one case that they have extensive knowledge on (to facilitate a 'deep-dive' discussion).

Whilst, this content could be provided through a selection of videos, students really appreciated the face-to-face connection with these professionals. In fact, students commented that the ability to ask questions and engage in discussions with these professionals was one of the highlights of the module. To align the content, I have secured guest lectures that have been involved in the module before but have provided instructions in terms of how to create the pre-class material and the face-to-face session (as they previously delivered through a traditional lecture format) I, therefore, have oversight of the different guest speakers' content to ensure it is complementary, not duplicative, and that the learning outcomes and module assessment can be achieved (e.g. learning conversation on one type of collaborative partnership). This module runs twice a year and I will collect feedback from the student cohorts to improve the student experience in the following year.

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Appendix 1: List of Publications for Analysis

First Author	Purpose of paper	Study sample	Relevant findings
Muller, F (2020)	Literature Review on technology supported management education	N/A	Not enough research on the effectiveness of flipped classrooms on improved learning.
Roberts, B (2020)	Evaluating student performance when using flipped classrooms for MBA Dental students	University's Dental School that provides a dual degree with MBA	Flipped classrooms increased student perceptions of preparedness for practice.
Schlegelmilch, B (2020)	Exploring higher education strategies for MBA programmes	N/A	The changing competitive environment of business education providers requires changes in teaching and learning.
Swart, W (2020)	Evaluating student performance when using flipped online classrooms for Business Analytics	East Carolina University's business analytics students (both undergraduate and MBA)	Flipped classrooms resulted in improved student satisfaction and grades. There was parity in student performance regardless of if class time was online or face-to-face.
Avolio, B (2019)	Reviewing challenges with current business education teaching methodologies	N/A	Identified MBA specific challenges for both the teacher and student.
Dutta, N (2019)	Exploring pedagogy changes in MBA programmes to attract students	Institute of Technology and Sciences' engineering MBA students	Design classes around the millennial/postmillennial student, who are interested in experiential learning, having timely feedback, and thinking outside the box.

Bayley, T (2018)	Evaluating student performance when using flipped classrooms for Operations Management	Canadian University's Operations Management students (both undergraduate and MBA)	Flipped classrooms improved student engagement and lead to a deeper understanding and appreciation of the content.
Cundell, A (2018)	Explore effective design of activities in online environments	Centre for Teaching and Learning's Graduate Seminar in University Teaching programme	Online activities should focus on learner-to-learner interactions to promote higher level learning.
Wengrowicz, N (2018)	Evaluating student performance when using online flipped classrooms for Management Science/ Management Information Systems	MBA students in a university in the South-eastern United States	Online flipped classrooms enhance the student experience but only if both the teacher and students well versed in the online tools available.
Klotz, D (2017)	Evaluating student performance when using flipped classrooms for Operations	Fordham University's Operations Management MBA students	The introduction of flipped classrooms resulted in higher student grades and satisfaction.
Li, S (2017)	Exploring flipped classrooms in MD-MBA programmes	N/A	Flipped classrooms have positive perceptions, however, active learning is more important than teaching format.
Scafuto, I (2017)	Evaluating student performance when using flipped classrooms for MBA programmes	MBA students from five universities in Brazil	Identified MBA specific teaching considerations for a flipped classroom. The teacher is important for student perceptions of quality.

QR codes in Engineering Laboratories – Improving Student Safety Engagement

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Abstract

Engineering is a practical discipline and laboratory work is a fundamental necessity of engineering curricula and majority of engineering modules run by universities have significant elements of practical work embedded in them (Feisel et al 2005 and Rathod et al, 2016). It provides an active learning avenue that provides students with hands-on experience to support and strengthen in-lecture learning by enhancing the student's understanding of theoretical concepts (Nikolic, 2015). Laboratory safety is an important and continuous focus within academic institutions where a lack or lapse could sometime lead to serious or even fatal consequences. Using Quick Response Codes (QR Codes), students can access, on-demand, the necessary training and safety instructions for them to use specialised engineering equipment and/or carry out specially designed procedures, imbuing them with specific knowledge to execute laboratory activities confidently and securely. Mobile devices in teaching have been a topical issue and the use of QR codes aims to create an independent learner through the engagement using personal technology like smartphones and tablets with the intention of improve the level of engagement during active laboratory activities by using a medium that the students are au fait with. This paper outlines the delivery method used in the implementation of QR codes within 1st year engineering laboratories to aid basic safety training for engineering practical activities. It also discusses the potential use of QR codes in engineering laboratories to deliver on-demand information and capture training needs at the time and location that is required.

Introduction to Laboratories in Engineering Education

Engineering is a practice-based subject where doing is key. Laboratories are used through all levels and disciplines in engineering education as a way to demonstrate basic information and gain hands on practical skills to compound their understanding of theoretical concepts and implement application-based practice (Sedghpour et al, 2013)

The ability to successfully accomplish a practical task is an important professional skill requirement, designated by The Engineering Council (2014) as a key competency required of an engineer. The engineering profession requires manipulation of resources for the benefit of humankind. To accomplish this, engineers must have knowledge that goes beyond theory, a knowledge that is normally achieved in hands-on, practical laboratories.

Laboratories are hence an indispensable aspect of developing these disciplinary, practical skills required, e.g., from learning to use modern engineering tools and equipment to the ability to conduct experiments, and one of the core elements of these skills includes the ability to conduct the task and themselves in a safe and effective manner. Being a practical profession, labs also support and develop their self-identity as an engineer (Edward, 2002). Student satisfaction must be at the core of any laboratory experience and Nikolic (2015) has demonstrated that resources that provides details on how to satisfactorily conduct a task have yielded the highest satisfaction scores.

Types of engineering practical are dependent on specific engineering disciplines with different emphasis on the type of core knowledge and skillset required, for example, an electronics student might need to be familiar working with soldering irons while a mechanical student would need to be handy with mechanical hand tools. However, the hands-on aspect of practical work often has significant safety related risk associated with it, which must be prioritised and addressed accordingly in order to provide an immersive experience for the student to learn in a safety environment (Shariff et al, 2012). The practical aspect of health and safety is critical in engineering and there is an identified need to ensure that students leaving university are equipped with the knowledge and principles of safe working (EU-OSHA, 2010).

Safety in Engineering Activities

Accidents in laboratory setting are a concern for universities (Ismail et al, 2015). A typical engineering laboratory setting, for example, contains multiple hazards - acids and chemicals, hazardous equipment, pressurised gas, poisonous fumes etc. There is hence a concern that students often face a variety of risks and threats whilst working and participating in laboratory activities. Whilst we acknowledge that serious accidents in academic laboratory environments are fortunately rare in the UK, they are by no means uncommon. Ensuring the safety of students under our care is not only our legal obligation but also a moral one. By providing the necessary training and education to work to prevent harm in practical activities, we are thereby helping the student to fully benefits from the hands-on learning activities.

Accidents in labs can be the result of many factors, with the lack of appropriate knowledge and attitudes toward safety and unsafe personal practices being pertinent factors that are beyond the control boundaries of supervising staff or control measures put in place (Abdullah and Aziz, 2020).

QR Codes for Safety Learning

Engagement with learning using mobile devices is exciting for students (Lynch, 2015). Students tend to respond more positively to the stimulus when using mobile devices and they tend to stay focus on the task thereby enabling them to self-correct as they proceed

(Lynch, 2015). Mobile devices also provide students with the opportunity to engage with the activity outside the lab and possibilities to prepare prior to sessions. Personal technology is an “anywhere, anytime” learning tool to support the development of self-regulated learners, encouraging independent learning through engagement (Mueller 2011). Kolb (2008) discussed a ‘disconnection’ between how students learn outside of school and how they learn in the classroom, and as faculty, we have little appreciation for the skills that students use outside of the classroom. We tend to think of devices such as cell phones as “toys” and see these technologies as distracting and even harmful. Kolb (2008) urges the recognition that smart mobile devices can be a powerful tool for education and to find ways to integrate them into the classroom. With the changing educational landscape, it is important to recognise that students learn in many ways and therefore the delivery of educational content should adapt accordingly. Joordens et al. (2012) have reported that most students show a higher level of willingness to learn when technology enabled learning practices are employed.

QR (Quick Response) codes, small matrix like codes, can be readily accessed, usually with an app, using most smartphones or smart devices that have integrated cameras. QR codes are also easy to generate, implement and manage. Information can be updated at point source hence reducing the need for changing the information individually. QR codes provide immediate valuable and relevant information to the user at the point of contact and are highly trackable. Users are able to scan these codes and get access to the timely, knowledge and information at the specific location, for a specific lab equipment or at the point of need (Walsh, 2010). QR codes are used to provide a link to content found on the Internet, are increasingly seen in many places, with point of need information successfully employed in libraries and museums (Ashford, 2010, Pulliam et al, 2010 and Shultz, 2013) and it is this point of need information that is highly relevant to what this project is aims to achieve.

This project aims to engage engineering students through bespoke safety, instructional materials using embedded in QR codes during active learning practical sessions. Training will then be achieved through the incorporation of self-directed, user-focussed instructional materials with relevant information for equipment, instrument and technical procedures. This paper sets out the delivery method used in the implementation of QR codes within 1st year engineering laboratories to aid basic safety training for engineering practical activities. It also discusses the potential use of QR codes in engineering laboratories to deliver on-demand information and capture training needs at the time and location that is required.

Engineering courses often have big cohort sizes and often have either large practical classes or open access lab sessions. This makes it difficult to ensure that all students fully understand/remember the instructions given to them for a variety of different reasons. The instructional videos aim to give students another avenue to learn/review the instructions and use them as a recall tool should they require it. With this knowledge, the student is then able to safely carry out a task. This increases their confidence to perform the activity,

thereby increasing their engagement with the task and their satisfaction when they complete the activities (Figure 1).

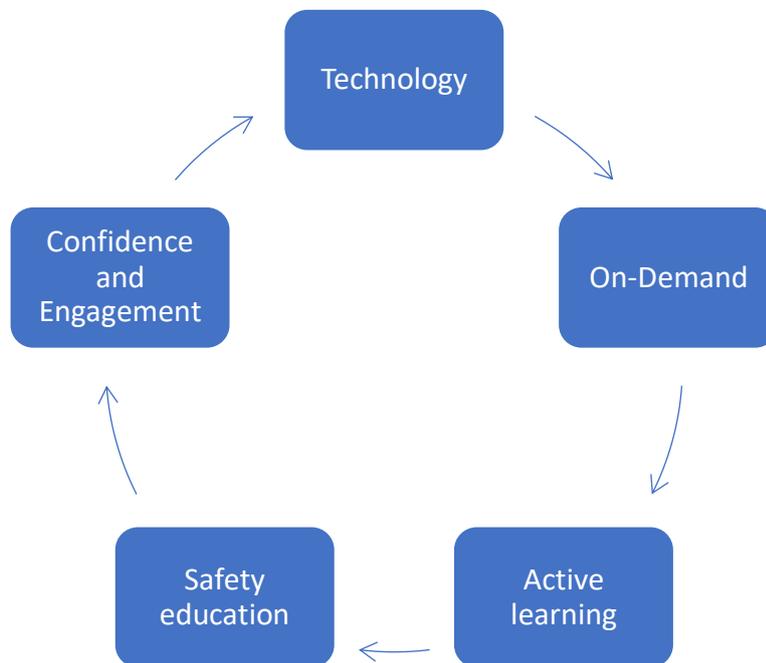


Figure 1: Project Motivation Factors.

Implementation Methodology

The implementation plan was carried out in three phases: equipment scoping, storyboard planning and material creation. Videos and materials created were uploaded onto Vimeo (<https://vimeo.com/>), which is a free online video sharing site. QR codes linking to the relevant videos were then generated using an online QR code generator (<https://www.qr-code-generator.com/>).

Project implementation was carried out in the laboratories within the Department of Engineering. The project team consisted of academic staff, technical staff, apprentices and two second year Aerospace students. The rationale of engaging the technical staff was for practicality reasons, being familiar with the equipment and the safety measures required for use. Their knowledge of the equipment and lab activities contributed toward storyboard planning and the subsequent material creation. Students were consulted during the initial equipment scoping exercise to provide an insight to equipment that they have used in their studies and felt that would benefit from the QR code implementation.

Equipment Scoping

There are approximately over 100 individual pieces of equipment and related activities in engineering that are in constant use by staff and students for teaching and research

purposes. It was hence important to identify equipment and its associated activities that would benefit the most from this implementation. There are several factors that determined which equipment would be adopted for a pilot implementation, the inherent safety of the equipment, frequency of use by students, ease and effectiveness of training using a video medium. Two initial scoping meetings were held with students to discuss options and also to gather information on what students identify as essential in the video. Outcomes of these meetings have identified the following,

1. Clear and unobstructed view of the demonstration, with emphasis on safety or how to achieve a safe state when performing key tasks within the activity.
2. Narration or voice over to help them understand what is going on.
3. Short video length to aid attention retention and cognitive loading.

Three common, first-year activities have been identified by the students for the pilot implementation, soldering, balsa wood manufacturing techniques using hand tools and laser cutting. These activities form the most basic of skills required for the majority of engineering students over the course of their studies.

Storyboard Planning

Storyboards are used to map out the entire video, frame by frame, before the start of filming. Storyboarding is an efficient and effective project planning tool to help identify and illustrate the various steps needed to complete a given project in a sequential manner (Barakat, 1989). Storyboards provides a structure link between the content authors and video creators before production process ensuring that key messages do not get lost in translation and errors are eliminated before production starts (Okur et al, 2010).

Storyboarding is the focal point for planning and starts with determining the learning outcomes for each activity, the key skills demonstrated to students and the relevant control measures to ensure the activity can be performed safely (see Table 1). Length of videos was an important consideration and storyboarding allows us to determine the time required for each scene.

Table 1: Example of activity planning.

Activity	Learning Outcome	Demonstratable skill	Safety Measures Demonstrated
Soldering	Safe soldering practice and use of extraction	<ul style="list-style-type: none"> Using a soldering iron Soldering with extraction 	<ul style="list-style-type: none"> Extraction use and check Awareness of hot soldering tip.

Material Creation

The aim is to equip students with knowledge and training to safely perform their lab activities using bespoke instructional videos. These user centred videos focussed on safe working principles were recorded in engineering laboratories by technical staff for each of the activity. Narrations and captions for the videos were added post-production. QR codes were generated for the videos and the codes then placed on or in the vicinity of the equipment for ease of access (Figure 2).

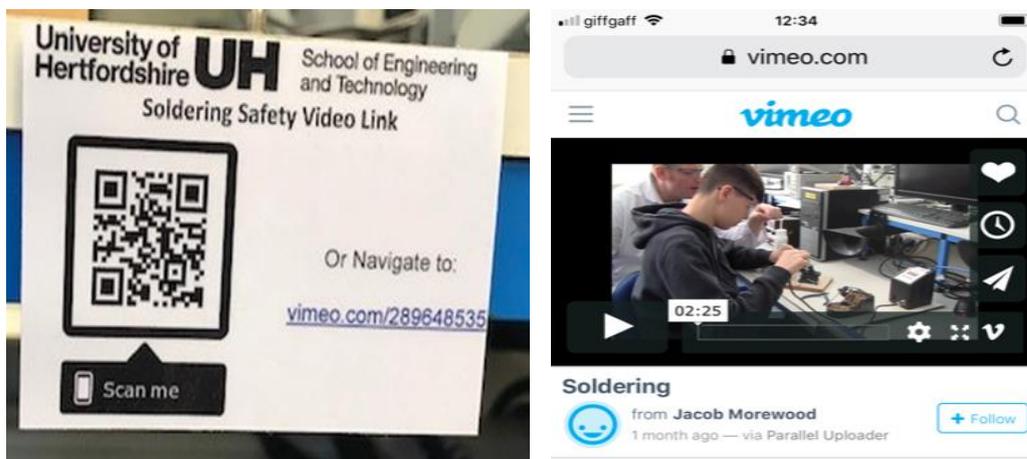


Figure 2: QR codes for soldering in electronics lab.

The QR codes will embed in them, links to bespoke instructional videos and/or training materials for the safe use of equipment and demonstrate procedures for specific activities that are deemed hazardous to perform with prior specific training and/or instructions. These codes are located on the equipment itself or in a nearby location. It must also be recognised that not all students own a smartphone or want to download the free QR reader app, hence it is anticipated that all information will also be available on Canvas or in any relevant information provided to students. This academic year, due to the need to supply tools for students to complete practical work at home, QR codes have been included in the relevant risk assessments and project information handbook for students (Figures 3 and 4).



Figure 4: Examples of QR codes developed in this phase that are currently available to students.

The Future of QR in Engineering Labs

Mass training sessions, whereby all students are trained regardless, are ineffective, resource and logistical demanding and do not cater to the specific needs of individual students. The QR codes hence act as bespoke training tools for the students that require the specific training. A well-prepared video or instruction helps avoid the issue of variability in quality which may arise when different staff members demonstrate techniques to different students. Time is also saved if students watch the videos as advance preparation for the sessions hence enabling them to have a more productive time during the session.

The potential of QR codes in engineering laboratories is endless, placed out-side of laboratories, QR codes could indicate lab information and facilities without having to enter, what class is taking place and what the class is currently working on to ensure that students are in the right place at the right time. Similarly, codes placed outside of research labs could link to sites describing the research conducted, providing contact information for the researchers and linking to further resources on research interests, such as past publications, to promote research within the body of students.

Impact from this will be from the enhanced engagement due to increased confidence with the practical tasks due to clearer instruction and training. This will result in a better and more efficient use of staff in these sessions as they can focus on giving assistance towards the task rather than teach students on how to operate machinery. After initial training, students can tend choose to access the materials again for refresher, as and when necessary or use it as a live demonstrator during laboratory sessions to help them get through areas that they are experiencing difficulties with.

Discussion and Conclusion

This paper has outlined how the implementation of QR codes containing safety training was designed and roll-out to students in Engineering. A total of three videos were identified and recorded for students. Although the focus of this project is primarily health and safety, the

use of QR codes can be easily extended to also include other relevant information that can complement the learning experience, for example, linking reading list for enhance background reading or manufacturers information for further reference. The flexibility and ease of implementing this technology also means that it could be easily extended to other schools and for non-academic purposes, like information on artwork across the university.

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Developing independent learners in maths using threshold concepts: transitioning from A-level to first year university maths

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Abstract

One of the key roles of a university is to create independent learners. To achieve this students need guidance on how to learn independently, help to build their academic confidence, and direction on learning the discipline. This article investigates ways in which teachers can develop independent learners, specifically in the discipline of maths, with the focus on activities for first year university students. The activities proposed can be implemented within a standard university setting. Specific barriers to student learning are the threshold concepts of the discipline. Teaching students how to recognise and work through the threshold concepts can help them to develop as independent learners as well as speed up their learning progress. The following activities have been explored within a first-year university maths environment:

1. A group presentation to enable students to get to know each other and to start developing their communication skills.
2. Students explain a threshold concept to their peers.
3. Students create their own maths problems and peer-review problems.
4. Weekly guidance on tasks expected of students to show them how to learn independently.

By making several changes to my teaching practice and assessments it has been possible to increase the focus on developing independent learners. Providing a more diverse range of activities has resulted in increased student satisfaction.

Why do we want to develop independent learners?

We are at a unique time in history; the way education is being delivered is rapidly changing due to the Covid19 pandemic. Rather than university education stopping during the pandemic it has been provided using online learning. The widespread use of the internet and personal computing devices, the vast amount of knowledge and educational material on the world wide web, and now the mass use of these tools for education during the pandemic means that we can harness this opportunity to change how we teach and learn. We have the ability to make our teaching work as an individual experience for the learner, the key question is how. This article addresses ways in which we can encourage individual

learning by developing students who are independent learners able to take full advantage of the knowledge and learning materials online.

A key question when changing to more online teaching is what is the purpose of face-to-face activities at universities? [Barnett, R., 2004]. Do we need students to be in the same building for them to learn? This is a scary question to ask of teachers because it potentially challenges our jobs but it is an important question to ask. I believe that we can improve the way we teach using individualised online learning while, at the same time, still require the need for human interaction to explain, encourage, praise and provide forward signposting. When learning there is the need for discussion of the key concepts and the sticking points. The way we teach now, in lectures with large numbers of students, is not the best way of allowing students time with the 'expert' to overcome their personal bottlenecks. Although every student is different and requires individualised teaching, there are certain concepts that many students struggle with that the teacher can focus on to enable student progression. These are called the threshold concepts.

A key for developing independent learning (or any learning) is that students need the 'will to learn' [Barnett, R., 2007]. As Barnett says: "*Our job as teachers is to sustain and develop the students will to learn*" and "*To provide diverse activities that enable learners at 'whatever level' they are*". I report on my investigation into the use of a range of diverse activities, that are based on developing threshold skills and concepts, and to develop independent learners who can communicate and work collaboratively in maths.

Guiding students to be independent learners

Guiding students to be independent learners does not mean leave them to make their own notes, learning plans and to study what they have been told to study. It means showing them what they can do to learn how to study independently. In their first year students need more direction and help in order for them to learn how they can study on their own [Alcock, L., 2012, 2018a]. It is essential to 'educate' the students how to learn independently so that they can move successfully into the second year of their degree where concepts get harder. The better prepared they are in the first year then the more likely the student is to complete their degree successfully.

Alcock, L. [2018b] starts from the premise that the "*lecturer guides and orchestrates student activity*" and uses four practices that provides structure for the students' learning: routine, announcements, breaks and notes.

1. Have a clear weekly routine showing the student what is expected of them.
2. Be well organised and tell the students, e.g., put up 'handwritten' announcements each lecture.

3. Two minute breaks in lectures every 25 minutes: work to their concentration span and allow reflection time.
4. ‘Gappy’ notes given out each week (4 pages per lecture plus problem sheet) – this shows the students what they need to learn (gives the ‘feed forward’) and they can fill in the gaps themselves. The lecturer is giving them a start to their note taking.

Providing a clear structure develops the students’ own study routines and habits and teaches them how to become an independent learner.

Using online learning to develop independent learners

Some of the noticeable impacts of working significantly online during the Covid19 pandemic is that students are saying they are lonely, that they get screen fatigue and that they find it more difficult to concentrate so the workload seems overwhelming. Academic isolation should be considered here. It is the role of universities to guide the student through the paradigm of the discipline making sure that they have properly understood the key concepts and have got through the threshold concepts so can progress to the next level. It is equally important for the universities to provide the opportunity for the student to interact with others to discuss the academic subject and to provide an academic community, otherwise what is the purpose of the university. The students learn by being part of that academic community and it is even more important to provide that during online teaching through as much live online interaction and group activities as possible.

Teaching to the threshold concepts

Meyer, J., and Land R., [2003, 2006] defined a threshold concept as knowledge that is “*central to the mastery of their subject*”, and can be transformative, counter-intuitive and troublesome [Perkins, D., 1999]. A set of threshold concepts and skills for first year maths are shown in Table 1. The threshold skills are taken from Budd, C. [2020] and the threshold concepts are those that are from Meyer, J., and Land R. [2003] and from my own experience.

Table 1: Threshold concepts and skills in maths for first year university students

THRESHOLD CONCEPTS	THRESHOLD SKILLS
Transposing equations	Procedural fluency
Calculus: Partial & implicit differentiation	How to set up equations for a problem

Deciding the method for solving integration problems (particularly by substitution and by parts)	
Complex numbers and the concept of 'mathematical space'	Mathematical proofs
Transforming co-ordinates	Communicating maths (to mathematicians and non-mathematicians); use of precise language – written and verbal skills
Limits of functions Convergence and divergence of series Approximating functions	Creative problem solving Applying the maths to real problem

Land, R., Cousin, G., Meyer, J.H.F. and Davies, P. [2005] advocate a focus on threshold concepts and Breen, S., and O'Shea, A. [2016] suggested that *"placing an emphasis on the threshold concepts involved in a course can enable teachers and students to focus on what is fundamental to the study and mastery of their subject"*. Cousin, G., [2006] says that *"a focus on threshold concepts enables teachers to make refined decisions about what is fundamental to a grasp of the subject they are teaching. It is a 'less is more' approach to curriculum design."*

All too often we use exams and tests to check the student's knowledge. Getting the student to discuss and talk about the concept could be a better way of assessing. Research from China [Yiming, C., 2019] showed that increasing student participation, student-teacher and student-peer interactions enables more students to understand threshold concepts and so to progress quicker. This can be achieved by increasing the discussion and presentation based activities [Zhao, W., Mok, I. A. C., and Cao, Y., 2016]. It does not mean just asking questions in the class, it is about encouraging students to talk to each other, to the tutor and to be confident giving solutions on the board. Participation needs to be gently nurtured in the students to build their confidence. Learning is an emotional thing [Cousin, G., 2006]. If the student feels nervous, anxious, shamed, scared, humiliated then they will stop engaging. Maths students are particularly reluctant to talk in class if it is done in the wrong way. Slowly building the students communication skills in a compassionate, encouraging environment creates a safe space where students can learn without fear or failure.

It could be said that providing step-by-step guides and modifying the teaching to match the students' misconceptions is spoon-feeding the students and is not developing their

independence. But what is independent learning? Allowing the students to stay with their misconceptions is not teaching the students. The role of the teacher is to identify where the students get stuck and get them through these threshold concepts by providing the students with the mathematical tools and skills. As the students learn how to identify what concepts are preventing them moving forwards and learn how they can move through these thresholds then they become independent learners. The role of the teacher then becomes that of a sign-poster rather than a spoon-feeder of the knowledge. Signposting requires feeding forward to show the students what they need to know next and directing the students to where to find the information and showing the students how they can assess their own progress. Continuing with a single plan of teaching regardless of what the students are learning is the spoon-feeding.

The lecturer must do work to break down the topics into steps. I have found that the students ask for the mathematical steps – they are instinctively wanting this. This is ‘decoding the discipline’ and can be difficult for the expert because some of the steps have become instinctive and tacit knowledge for them so they have forgotten what they need to tell the students [Houston, K., 2009, 2018]. There is a reluctance by lecturers to provide these steps because they want the students to work them out for themselves, however, it is important to recognise that the steps give the students their first taste of the task they need to do. As they practise these steps, they begin to see the patterns and gain the procedural fluency. This allows them to cross the threshold. The ‘laid out steps’ help the students to cross the threshold. Without this help they may take longer to reach the understanding. The aim is to get them to the threshold understanding as quickly as possible so that they can start using the concept, solving problems and go to the next level. ‘Feed-forward’ allows the students to see where they can go next once they cross that threshold. So rather than let the students struggle to find the steps they need, the lecturer provides the steps and then the student uses them in the exercises.

This way of designing what is done in the classroom is backward design [Wiggins, G. and McTighe, J., 2005]. It identifies the desired outcome and it identifies those students who are crossing the threshold concepts and developing the right skills. This is a good way to find out the individual understanding but can be time consuming for the tutor, so we generally do this via exams. Exams are not necessarily the best way to find out whether the student has crossed the threshold because they could have just learned how to solve that one type of problem. What we want to assess is whether they can apply their knowledge in new ways. This creativity is difficult to test in maths. Testing it with new problems each year can be a restriction because there may be a few particular problems that are good at testing the skill and then once used cannot be reused in following years.

Changes to my teaching practice

To implement these ideas for developing independent learners using threshold concepts I modified my teaching practice and changed several of the first year maths assessments.

Changes to assessment activities

I focused on assessments where the students have to communicate the maths. The first activity was a group presentation on the history and application of a calculus topic. The second activity was for the student to explain a threshold topic to their peers. The third activity was for students to create their own maths problems. All activities were easily introduced within a typical university setting. The aim of these assessment activities was:

1. to promote discussion and understanding of the threshold concepts,
2. to increase student-teacher and student-peer interaction,
3. to build the students' confidence to talk about maths.

In addition, the activities were designed to allow students to extend their knowledge beyond what was taught in the lectures particularly for those who had already covered the topic at A-level. The activities added variety to the assessment tasks making the course more interesting for the students and promoting engagement.

Activity 1: Group presentation

Students prepared and presented a group talk on a calculus topic of the students' choosing that had to include an historical element, a mathematical explanation and an application. The assessment was held during the first term to provide an opportunity for students to get to know other students, particularly during the pandemic lockdown, and to establish early on that communication is important. It was the start of building their confidence to talk about maths. The presentations were given within a small group to reduce the anxiety for students. Guidance was given to the students about how to prepare and deliver a presentation and on how to work together. In terms of teaching time, setting the activity took less time than a standard assignment of set questions but it took more time organising groups than anticipated and required more discussions with students. This interaction with the students had the added benefit of an additional opportunity to get to know them individually. Not all groups were successful though and some students did end up working on their own (where the other students did not engage).

Sixty four students were involved in the activity with 75% of them making a presentation. They were split into groups of up to six students and each group presented within their small group tutorials. Student feedback from the activity was collected by the tutors at the end of each presentation session. In addition, I asked tutors to give me their views on the activity. Twelve students said they enjoyed the task, particularly researching the topic and the history of the topic. Nine students said they found it helped their maths and motivated them. Several of the presentations were on topics that were beyond what was taught in the lectures with one student saying that it was more useful than a numerical assignment. Interestingly, the students also said that the activity made them appreciate that working in

groups and making presentations are important skills, with one student saying that it helped them in “overcoming shyness”. The main difficulty the students mentioned was communicating as a group due to lockdown restrictions preventing face-to-face meetings and they would have liked more time to work on the task. The feedback from the tutors was that they “enjoyed listening to the presentations”, it was a “useful exercise” and that it helped the students’ confidence. About half the tutors who commented said the level of maths was as expected and about half said it extended the students’ maths knowledge. Overall, the activity engaged the students, developed their confidence to talk about maths and for some it extended their understanding of the maths.

Activity 2: Explain the maths

This activity required the students to study a concept from a threshold topic and then explain that concept to their peers within their small group tutorial. Students picked a theorem or formula from the threshold topics and prepared an explanation that included a proof or derivation with a description of the type of proof used. The objective was for the student to focus on the proof and in that way extend their understanding of the topic as well as develop a threshold skill. The activity had the added benefit that the students learned from listening to their peers. It also provided an opportunity for the tutor to find out where misconceptions existed. The assessment was held in the second term and built on communication skills developed in the group presentation. Seventy per cent of students participated in the assignment.

The students varied in their feedback; some found it challenging, some enjoyable and some found it easy. The majority of tutors felt it was a useful exercise and that the students did improve their presentation skills compared to the group presentation. Some students extended their knowledge beyond what was in the lectures while others did not include a proof or derivation and did not extend themselves mathematically. It was apparent to the tutors that some students did not understand what they were presenting. This highlighted where students did not understand a threshold concept.

There are several changes that can be made to this activity to improve it. Due to the lockdown the explanations were made online as presentations rather than using a whiteboard. This was not the intention of the activity so the first change is to require the students to use the whiteboard when explaining the maths. This will develop the students’ confidence in solving problems at the whiteboard and to talk about maths in front of their peers (as shown by Yimming, C. [2016] to aid learning progression). The second change is to provide more in-depth instruction to the students on different types of mathematical proof. As a threshold topic, some students required additional help to understand the task.

Activity 3: PeerWise - create maths problems

The third activity was designed to promote peer-interaction and develop threshold skills. It required students to create their own maths problems and solutions and then to solve and comment on the problems that their peers created. An online application called 'PeerWise' [Denny, P., Hammer, J., Luxton-Reilly, A., and Purchase, H., 2008] was used for students to create and store their questions. As the teacher, I could track how frequently the students participated in the activity enabling evaluation of student progression and engagement. As Dreyfus, T., [1991] said "Students can use the standard procedures but struggle to use them in a flexible manner". This activity addressed this and was a way for the students to practise the threshold skills of procedural fluency, setting up equations and using precise language.

I set up PeerWise as a formative activity to encourage participation. However, the opposite happened. Without the reward of achieving grades the students did not participate. In future, this activity will be a graded assignment to ensure that the students engage and practise creating their own maths problems.

Routine changes to my teaching practice

The transfer to online teaching due to the pandemic required changes in teaching practice. The student feedback at mid-term resulted in two important requests: to get personal progress updates and to have live lectures. In response to the students, I introduced changes that also focused on independent learning. Once these changes were put in place the student feedback changed to be more positive; there were no negative comments in the end-of-term feedback.

Providing structured guidance

To support the students to become independent learners I introduced the practice recommended by Alcock, L., [2018a] to provide structure and organisational advice to students on a weekly basis. The weekly announcements that I was previously making became more focused on directing the students to the tasks that they could do each week to develop their own learning skills and guidance for their own study routines.

Weekly topic quizzes

To enable students to see their personal progression weekly online topic quizzes were introduced. Before the lockdown, the students brought in written solutions to set questions into the tutorial which the tutor then graded. Moving to online teaching took away that weekly interaction with the tutor which, although brief, was still a point of personal feedback for the student. The introduction of a weekly short quiz, some formative and some summative, allowed the students to see their progression and also practice exam style questions. The quizzes also allowed the teacher to see individual student progression and identify those students that were not participating. These topic quizzes will continue when

face-to-face teaching recommences since they provide structure to the weekly maths practice and tracks progression.

Live online lectures

When the lectures moved online at the beginning of lockdown the lectures were pre-recorded. Many students like this flipped learning approach but some students commented that they felt isolated. Live lectures were then put in place that were recorded so that the students had a choice of watching live or recorded. Feeling part of a learning community, and particularly developing that community for first years, is an important role of a university whether that is online or on campus. Live online lectures provided the students with an opportunity to ask questions, to hear questions from their peers and to feel part of the academic community.

Conclusion

Assessments that required student-interaction were trialled as part of an adjusted programme of maths activities to develop independent learners in a first year university environment. By making a few changes to the teaching practice, including weekly guidance and changing several assessment activities, it has been possible to increase the focus on developing independent learners and on teaching to the threshold concepts. Comparison of student feedback before and after the changes showed that student satisfaction improved. It is too soon to know the impact of the changes on students' ability to learn independently.

In future, the activities that have been trialled will be continued; particularly the group presentation assignment to develop communication skills, weekly announcements providing organisation and routine, topic quizzes to provide personalised progress, and step-by-step teaching in live lectures to master the threshold concepts. The assessment activities will be improved. Using PeerWise to develop threshold skills will be tried again as a summative assignment. The 'Explain the maths' assignment will be modified so that students have to use the white board to solve a maths problem with the aim to increase their confidence to do maths in front of their peers.

This work has shown that a focus on developing independent learners requires a multi-faceted approach, including the design of the assessments, the focus on threshold concepts in lectures and the teacher providing habit-forming routines and forward-signposting to the students. Such a focus can increase students' willingness to learn and speed up their progress by tackling threshold skills and concepts.

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Developing a customer-focused approach in teaching level 4 / 5 graphic design students

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Abstract

Studies have shown that progression from academic courses to 'real world' employment sectors is very challenging for graphic design students (Grieve and Meek 2015; Chiang et al 2018; Swanson 1994). From employers' perspectives, having experience in the 'real world' design sector, or as Grieve and Meek 2015 called the 'business of design', is an essential skill for recruiting a graphic designer. In this case, re-evaluating the Graphic Design curriculum by including multidisciplinary Project Based Learning (PBL) can provide graphic design students with the experience of a customer-focused approach in the 'real world'.

This article demonstrates the development of a multidisciplinary PBL module that increases the connectivity of Graphic Design and IT students' academic courses with industry. On one hand, the multidisciplinary aspect of the project improves the skills of students to work within a design team in future. On the other, involving real customers with different cultural backgrounds from the industry, helps to improve the student's commercial and communicational skills.

Introduction

Taking academic design courses at universities is usually considered as a reliable source for graphic designers to become prepared for a professional career (Wilson 2014, Davis, 2005; Frascara, 1998). In this case, many surveys and analysis take place to assess the practicality of higher education design courses in transferring the students to a professional design career. However, analysis demonstrates that the graphic design graduates do not meet the requirements needed by the 'real world' design industries (Adu, 2015; Debbie, 2011; Hsieh et al, 2010). As expressed by Cheung (2012), the 'real world' industry is not a training place for the designers. Having 'working experience' plays an important role in decision making for recruiting a designer rather than having a degree. In this case, Greig (2014), argues that: "in fact you might feel like you learn more in your first four weeks of working rather than on the four years of your course."

The 'real world' industry expects graphic designers to work fast, have knowledge of practical work, be able to persuade the customers and economically charge the clients for a reasonable price (Okyere 2017). In this case the informal trained designers seem to be more skilful due their higher level of 'work experience' rather than a highly educated graphic

designer with a professional degree. Nowadays anyone with knowledge in using design software could be a designer (Debbie, 2011).

The fact is that the universities prepare students with a high level of conceptual design thinking, in return, the 'real world' graphic design jobs require them on one hand, to have digital skills for creating a high-quality design to be visually pleasing and makes the business's brand stand out (Muratovski, 2016). And, on the other hand, it required the students to have a high level of communication skill to be able to communicate and negotiate with customers to get the orders. As Swanson (1994), states, one of the significant graphic designer's skills is 'persuasion'. The 'persuasion' comes from different aspects. First, considering the role of graphic designers in creating posters to advertise a specific brand, creating a high-quality and creative design engages and persuades the audience to place an order for receiving the service that has been advertised on the poster. In this case the graphic designers have to be 'creative' and have a high level of 'Digital skills'.

Secondly, considering the role of a graphic designer in a design company, beside design and branding the graphic designer has to deal and negotiate with customers to receive more design orders for the company. In this case, having a high level of communication skills and awareness about the cultural background of customers plays an important role for the graphic designer to 'persuade' the customers to place a design order. This phenomenon is highly required for freelance graphic designers as well. There is a gap that university courses do not consider that negotiation and communication skills are essential required skills for every graduate graphic designer. According to Innis (2017), "*A freelance career is something almost every graphic designer has considered.*" It is interesting that the most significant number of freelancers who are helping in the economy are Graphic Designers. As was stated by Rampton, (2015), "*Of the 53 million people in the USA who now refer to themselves as freelancers that contribute \$715 billion to the national economy, the majority are writers and developers, but a significant portion of this number are also graphic designers.*"

Research Analysis and Findings

I conducted an anonymous survey which did not need ethical approval, via social media in 2019, participants included twelve graduated students from Master of Visual Communication course from Kingston University in 2013. It revealed just one out of the twelve of students ended up working as a graphic designer and illustrator working back at her hometown at Shanghai, China; who expressed: *'although the University course was an exciting and high-quality course, she never managed to apply that high level of conceptual thinking and problem solving with her employer's company in China'*. The other eleven students all ended up working in different industries and businesses. Per the survey one of them established her own Property Estate Agent company in London. In responding to the question *'Why have you not continued to remain a Graphic Designer?'* she replied: *'It is challenging to negotiate with Customers. They only want a Graphic Designer to apply their idea. We all as an educated Graphic Designer know that the colour, forms, and fonts that*

customers ask us to apply are not appropriate for their branding. But negotiating and convincing clients to accept the Graphic Designer opinion is a difficult and demanding job.'

The difficulty of negotiating with customers has two different aspects, first, it may cause moral issues because when an educator has a piece of specific knowledge, knows that the customer's opinion is not appropriate for the required design, it is hard for the designer to ignore his own expertise and follow the customer's opinion (Shaughnessy, 2010). Therefore, it initiates a range of discussions between the designer and the customer. Because a graphic design educator has a conceptual thinking, therefore s/he assesses the outcome of a graphic design job based on conceptual knowledge and thought. Conceptual thinking in some cases diminishes the aesthetic aspects of a graphic design outcome. For an educated graphic designer, the quality of a design evaluates according to if the message is deliverable in its utmost understandable and clear way to the audience within the limited reading time. In this case, the aesthetic aspect and beauty of the design take a secondary role.

However, customers are not familiar with conceptual thinking and seek more aesthetic aspects of the work rather than thinking about the importance of delivering the message. They evaluate the quality of a design according to if visually it pleases the eyes, which sacrifices the importance of delivering the message clearly for the beauty. Although this phenomenon about the level of understanding the concept and role of Graphic Design in a society is variable in different cultures. Secondly, conceptual outcome, requires the graphic designer to put in more time and do more practice to achieve a high-quality outcome. In some cases, it would not be cost effective for clients. Based on my experience as the director of a Graphic Design company, it depends on the cultural background of clients and the level of their business, for example, if it is a small local shop, or newly started business, they might not be keen to invest too much on design and marketing. Therefore, even if a customer would like to rebrand its design's concept or have a new conceptual design it would be too expensive for them. Skills in communication and negotiating with customers are achieved through real experiences in dealing with customers.

The Problems

Within the graphic design courses, students are either considering an imaginary client, or a brief with a defined client provided to them. At the first circumstance where there is not a defined customer, the students are free to design according to their preferences. This practice is very enjoyable and improves the creativity of students. However, most of these practices are not applicable in the real world. As Anderen (2019) observed, in some graphic design exhibitions the artworks have been created just for the exhibition, which cannot deliver the feeling of the real graphic design world.

In contrast, within graphic design courses, sometimes a brief is provided to students which defines a specific customer with special needs. In this case, even if the students are designing for a specific customer, the lack of negotiation and discussion with the customer

leaves the students open to a wider range of outcomes. Therefore, the assessment is still open to the outcome uniqueness and creativity of the student rather than assessing the outcome based on the real needs and the cultural background of a customer. The point is that the customer's need is mostly revealed through a process of communication, negotiation and discussion. Because not only the business requirement, but the preferences, feeling and opinion of the individual customer is part of the job requirements which is only achievable by direct communication and negotiation by the customers. Unfortunately, this important issue in graphic design courses at Universities is missing. Therefore, the assessments and feedback provided to students exclude the importance and vital role of communication and negotiation with customers. As a result, a graphic design educator would not notice about this issue until s/he starts to work within industry.

Solution

In responding to the above-mentioned problem, it is essential for higher education design sectors to evaluate to what extent an academic graphic design course could be beneficial for educators to achieve a professional design career (Dziubczyński et. al, 2018; Okyere 2017). As Grieve and Meek (2015), observed, the current pedagogical theories within the graphic design courses "are promoting 'work integrated learning', 'experiential learning', participatory 'communities of practice' and 'multi-model collaborations'." On the other hand, as it was clarified within the Higher Education visual communication programme regulations (Kingston University 2013; The University of Hertfordshire 2015), to provide multidisciplinary and multicultural learning experience within which the students become able to critically reflect on their own and other's practice. However, people wonder why it is challenging for the graduated students to achieve a professional career as a graphic designer right after graduation?

We should search the 'learning outcomes' in the 'real world' industry (Hoover, 2009). Therefore this article suggests a new multidisciplinary 'Practice Based Learning' module between the Levels 4 and 5 IT and graphic design students from the University of Hertfordshire (UH) and the North Hertfordshire college (NHC), which is supposed to initiate from the academic year 2020/21 in cooperation between The school of Creative arts at the University of Hertfordshire, the IT and Creative arts department at the North Hertfordshire College, respectively running at Stevenage and Hitchin campus, and the SK Graphic Design Limited. This teaching module has been approved by both UH and NHC.

Our Scenario

The new PBL module brings Level 3 students from the NHC to work with Foundation degree level 4 and 5 students from the UH, which will give a vision of the UH life to NHC students and provide them more information and future life opportunities about if they continue the course to the University of Hertfordshire. The workshops put students with a

multidisciplinary level (L3 with 4 or 5), from multidisciplinary backgrounds (IT and Graphic Design) together, to work on multidisciplinary projects.

For each project (assignment), the students are divided into different groups. Each group included the Levels 3, 4 and 5 IT and Graphic Design students. The SK Graphic Design Limited invites real customers who are local business owners and has been giving their design orders to the SK Graphic Design company for the last three years to come to the classes and explain their design requirements. Therefore, the students have the chance to have a mutual communication with the business owners. The students have to write a brief according to the customer's requirements. The tutors reevaluate the briefs. And finally, when the brief is ready the students start the design process for the real customer. As part of this module, the students have to visit the local business's place and communicate with the business owner multiple times, which result in amending the design for several times till they receive confirmation.

It has been approved by UH and the head of higher education at North Hertfordshire College NHC in 2019 that the outcomes of the workshops will be published as a hardcopy (Magazine) and digitally (Website). The hardcopy will be designed by Graphic Design students, and the Website will create, design, and develop by IT students. It provides the opportunity for students from both fields of study to publish their work in a real academic magazine and an actual website. For each publication the SK Graphic Design Limited also provides different ranges of printing materials, so the graphic design students decide which material is appropriate for printing the design. Therefore, they gain a real experience of the printing process as well. Both UH and the NHC are supporting the project financially.

The aim is to sell the magazine physically and digitally, in order to raise money. And as the result of the fundraising, we run talks, and events for both IT and Creative Arts students at both NHC and UH. There would be three issues per year: Semester A, Semester B, Semester C. Each issue includes 300 hard copies and digital online version.

The 'Learning outcomes'

This main aim of this project is *"not only to support the students, but also to challenge them"* (Hoover 2009). I believe a significant advantage of taking a 3 to 4-year educational course for students is to allow them to experience the challenges that they may face within their future careers. It is valuable to experience a failure and realize how to face a failed or challengeable situation before starting a professional career. As stated by Chiang et.al (2018), *"Most employers do not see the industry as a 'training ground' for graduates and they expect them to be able to meet clients' demands within business constraints immediately right after they join their companies."*

Therefore, providing a challenging situation assists students to think about the worst scenario and different challenges that they might face within a 'real world' design project.

The success of every Graphic design project depends on the level of mutual communication between the designer and the client because every design project has to publish to a massive audience after the designing process finishes. In this case, a spelling mistake, or inappropriate printing colours on the printed artworks and a wrong size of artwork, all will have a negative effect on the client's business advertising. On one hand, the students have to learn to prepare an appropriate contract depending on the design order and get confirmation from the clients before sending the design files to the print. On the other hand, the significant point is that if a mistake happens on the final printed job, how they have to deal with the situation and negotiate with the client.

Based on my own experience as a director of a Graphic Design company, the designer's method of negotiation with a customer in a problematic moment is very important to not losing the client (Shaughnessy, 2010). Within this new PBL module, we also provide problematic briefs according to the real experiences that I had in my career life as a freelance graphic designer and the director of the company; and will ask them to solve the situation. It provides IT and graphic design students experiencing real challenges. On the other hand, also we ask the students to anticipate the challenges may happen according to the real client's requirements. As my experience in working in industry with different designers, in challenging situations, especially when a mistake happens for a big order for the first time, many designers become anxious and depressed. It would be very beneficial for students if they have a chance to experience the anxious and depressed for the first time during the educational course and receive advice from clients and experienced designers about how to cope with different situations. This practice improves the student's confidence for becoming prepare for their future professional career.

Considering the industry expectations from graphic design graduates, analysis of the creative industries' requirement by Alliance Sector Skill Council (2011), revealed the need for 'hybrid skills' which included: 'multi-skilling', 'multi-Platform Skills', 'management', 'leadership', 'business and entrepreneurial skills', 'IP and monetarisation of multiplatform content', 'sales and marketing', 'diagonal thinking skills', 'creative skills' and 'archiving of digital content'. Considering meeting the industry's expectation, many researchers agreed that a combination of various forms of teaching methods including interdisciplinary, multidisciplinary and transdisciplinary is the most appropriate teaching and practicing method for the design students (Bennett, 2000; Fleischmann, 2018). In this case, the new PBL module includes an interdisciplinary and multidisciplinary workshop environment for the students.

It is important that even this new PBL module covers lots of issues besides the design principles, for example, the communication and negotiation skills and the brief writing; but it is highly against the liberal art³⁹. As Swanson (1994) mentioned, in the field of graphic

39 In this context Liberal Art refers to overspecialisation in multiple tasks.

design “a sense of coherence is important. Overspecialisation seems to be the enemy of coherence.”

There are lots of common design issues between IT and Graphic Design curriculums including Design for User experience, Branding and Web design. According to my experience, for creating a professional website design, knowledge in both Graphic Design and Coding is required. A designer who designs a costume design for a client, should be aware to what extent the coding and the technology allows him to apply the design. On the other hand, a web designer who makes the website live through coding, should have basic knowledge of how to select colours, typefaces and images. During my professional career it happens a lot that in order to create a website for a client; I, as a graphic designer, had to conduct several meetings with my IT colleague at the company who does Website coding; to come up with a professional web design that meets the new technology requirements and coding restrictions.

Currently, according to the feedback I received at my teaching sessions separately to Graphic design and IT students, in most of the cases, neither the Graphic design students, nor the IT students, cannot understand why they may need to work as a team with each other to create a design brand for a client. It seems neither group are aware of the specific skills that each group has in a specific area. As a result, since the new PBL module will put both Graphic Design and the IT groups together in a studio environment, they practice team working and will see the effect of working with different team members with different skill's background. This practice also informs the students, which group of people with which skills would be beneficial to work with for different projects in future.

Furthermore, for a graphic designer possessing the ability to educate the customers about the effect of design elements is essential for convincing the customer to accept the designer idea (Shaughnessy, 2010). In this case, for a designer having an updated knowledge about the technology and up to date design styles, plus a good theory knowledge about the principles of design is essential. Since convincing a customer to ignore his own design preferences, and instead, follow the designer's idea and design is a very difficult task which is not possible unless through achieving well knowledge and high communication skills. Conducting research by Phillips (2018), proves that most of the creative arts students have difficulty with reading. I believe providing different briefs including 'real world' customers, encourages students to improve their knowledge for the specific design order. However, it is not perhaps enough to cover the problem of lack of interest in 'reading' between design students, but it is a small step towards increasing their knowledge based on a real-life design order.

Finally, negotiating with customers engages with the very significant issue of culture. For any designer who is in direct contact with customers, it is essential to be aware of the fact that different customers with different cultural backgrounds require different communication methods. Graphic design students will improve their awareness, it is not an

easy job for one individual to discuss and negotiate with people from different cultural backgrounds. For example, based on my experience, people with a west-east Asian background like, Persian, Afghans, Kurds and Arabs, usually like to make a loyal relationship with people who they work with (Weinschenk, 2011). They usually like to feel if somebody is working with them, it's because of their personality rather than just the business. In this case, they usually like to bargain and receive a discount (Mak, 2015). Because giving a discount gives them the feeling that they are exceptional and in a higher level of working for the designer. It is part of the business for them to create a professional friendship link. However, based on my experiences in communicating directly with the customers to receive orders, this issue is different in working with European background people. They usually consider the business for the sake of business and wouldn't interfere with the personal background and characteristics of the designer or who is working with them in a specific job.

On the other hand, in designing a brand for a specific business or company, the culture of the business should be considered. Unfortunately, it is out of the scope of this research to explain the effect of cultural background on the design. However, concerning the importance of cultural background, it is not until Level 6 when universities highlight the role of cultural background. and ask students to consider the cultural experience of the audience in their design material. But I believe it is important to raise this awareness from earlier Levels 4 and 5, since not all the students continue their education. Therefore, they will not become aware of this importance, unless after a few years of work experience. With this regard, the new PBL module invites real customers from different businesses with different cultures associated which improve the student's awareness about the importance of considering the cultural issues in designing and in negotiating with the customers.

Conclusion

The multidisciplinary studio based PBL module provides a teaching method experiencing simultaneous 'tutor-led' and 'student-led' studying (Ghassan & Bohemia, 2013). Since students are working as a group, they experience a self-dependent design process from receiving the design order and creating the brief to communicating with the customers and finalising the design through a peer group engagement. In this case, the tutor's responsibility is to facilitate the learning process for the students. It could happen through providing feedback, assessment of the student's decision making and assisting with the design process. This module reflects in promoting a multidisciplinary module that responds to the needs of design businesses and creative industries. It increases the rate of graduates' employability by providing the students with real work experience.

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Neurophobia – Using playful learning as a pedagogy and investigating troublesome knowledge in the Level 5 Physiotherapy Neurosciences Curriculum

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Abstract

Anecdotally Physiotherapy students often struggle to grasp complex pathophysiological processes and knowledge associated content on their Neurosciences 2 module, this could be referred to as a form of neurophobia. In addition, previously it has also been highlighted that learner engagement from the perspective of both the tutor and student is relatively low when content is focused on more complex concepts. Playful learning, different to gameful learning or gamification, is a relatively new pedagogy designed as way to both engage students and is a tool to facilitate spontaneous learning, encourage active and physical engagement (Nørgård et al., 2017). It is anticipated this will be a useful approach to explore and engage students in both learning and understanding troublesome neuroscience concepts. Playful learning kinaesthetic activities have been introduced into the Neurosciences 2 module during lectures and tutorials for 2019/20 and this article will evaluate their effectiveness by seeking feedback from level 5 Physiotherapy students via use of a mid-module feedback questionnaire. Furthermore, troublesome concepts in NS2 will be explored using Decoding the Disciplines and Threshold Concepts pedagogical theories.

Introduction

The problem

The human brain has been reported to have over 100 billion neurons, and an estimated 100 trillion synapses, or connections, add to this the unquantified number of neurons running within the central and peripheral nervous system and purely from a numbers perspective neurology appears to be complicated, and it is (Herculano-Houzel, 2009, Owens and Tanner, 2017). Physiotherapists work within the field of neurosciences to rehabilitate people with neurological conditions, it is a well-respected specialism within the profession, and as such is taught as a core subject across the level 4, level 5, and level 6 BSc (Hons) Physiotherapy curriculum at the University of Hertfordshire (UH).

Neurophobia is a phrase first coined in 1994 as a phenomenon observed in medical students (Jozefowicz, 1994). It was an anecdotal observation noting an inherent fear of neuroscience as a topic and signs and symptoms including being intimidated by the topic, confusion, difficulties with synthesis of information and with the major cause linked to lack of basic

science and clinical integration (Jozefowicz, 1994). Since its first introduction, neurophobia has been investigated through robust empirical research, and indeed its presence has been confirmed in medical students, early career medics and GPs (Schon et al., 2002, Ridsdale et al., 2007). In a large study of UK medical students, Senior House Officers, and GPs neuroscience was rated to be the most difficult subject within medicine. Although there is some overlap between the neuroscience curricular content covered in both medical and physiotherapy education it is important to be cautious when inferring physiotherapy students may experience the same difficulties as medics due to the differing professions possessing a different role which will require different depths of knowledge.

Investigation of neurophobia within physiotherapy education has identified that although physiotherapy students do not experience fear of the topic, they do find it daunting and like the medics they find it difficult, complex and it requires a higher level of clinical reasoning (Walker, 2013). Strategies to address neurophobia in both disciplines include utilising a case-based approach, allowing time to consolidate knowledge and skills, integrated basic neuroscience with clinical neurology and simplify where possible (Schon et al., 2002, Ridsdale et al., 2007, Walker, 2013). Anecdotally physiotherapy students at UH have found their neuroscience modules, and in particular Neurosciences 2 (NS2) at level 5 difficult and have often demonstrated signs of neurophobia. Much work has been done over the last two years in order to improve the student experience and reduce neurophobia in NS2 by focusing on case-based learning, integrating basic and clinical neuroscience, streamlining content, providing study aids (workbook) and simplifying content whilst still maintaining the depth of knowledge required of our profession.

In comparison with the empirical evidence stated in literature we provide a greater number of hours and weeks dedicated to pre-registration neuroscience education than other documented medical and physiotherapy programmes, (Table 1). However, despite our efforts within our classroom we still see evidence of neurophobia in our students. Playful learning was introduced into the NS2 curriculum in Semester A of 2019/20 to help aid student learning, understanding and experience with the aim of reducing the observed anecdotal neurophobia. In depth reflection on neurophobia in the context of the NS2 curriculum content to date has not been investigated and therefore in addition to exploring the effectiveness of playful learning, pedagogical theories/frameworks will be explored in this article to explore this phenomenon further.

Table 1: Hours and weeks dedicated to the neurosciences discipline across the BSc (Hons) Physiotherapy Programme versus that documented in the literature in other UK institutions (hours do not include placement time)

Neuroscience face to face teaching	Hours		Weeks	
University of Hertfordshire	Level 4	56	Level 4	12
BSc (Hons) Physiotherapy	Level 5	75	Level 5	15
	Level 6	9	Level 6	2
	Total	140	Total	29
University of East Anglia (Walker, 2013)	Hours unknown		BSc	4
			MSc	8*
UK Undergraduate Medical Education (Risdale et al., 2007)	2.5-3 hrs/week		13	
	Total approx.	39		

*(4 evidence-based learning fortnights)

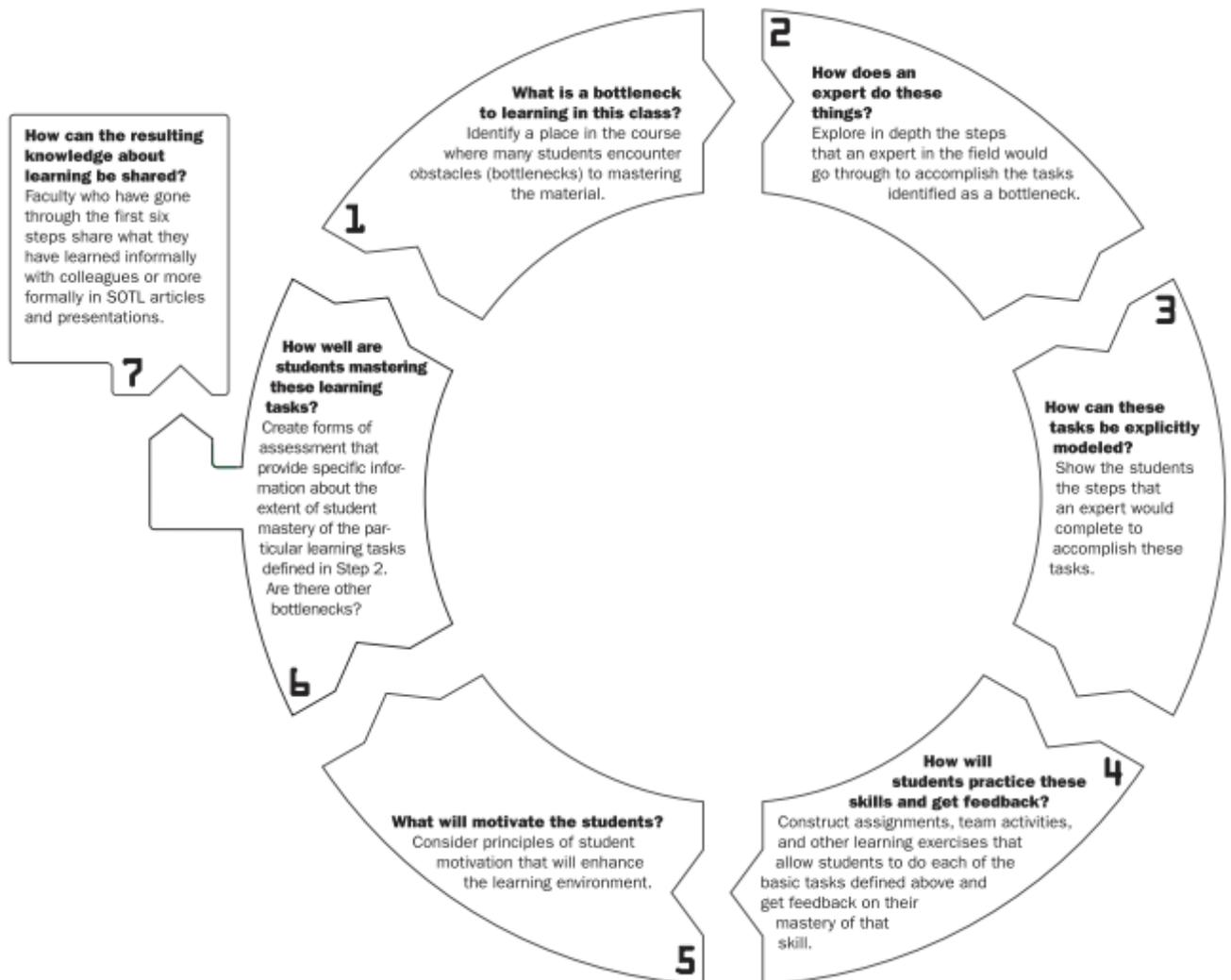
Decoding the disciplines

Neuroscience is complex and requires a high level of thinking and reasoning, conceptualising systems that you cannot see or touch, students are required to imagine patient presentations that they may not yet have seen in clinical practice, therefore making the topic difficult for students (Walker, 2013). Decoding the disciplines (DtD), an approach first described in 2004, identified that there can be a disconnect between teacher and learner regarding higher level thinking, more specifically how people think versus how they learn resulting in the discipline or curriculum becoming inaccessible to the learner (Middendorf and Pace, 2004).

As a lecturer it can often be difficult to fully understand the student perspective due to this knowledge/higher level thinking gap, and decoding the disciplines aims to reduce the gap and enable the transition from novice to expert (Miller-Young and Boman, 2017, Yeo, 2017). The lecturer is the expert and as such their understanding has become innate which can result in the unconscious creation of bottlenecks due to the inability to see the disconnect between their tacit knowledge and that of a novice (Neve et al., 2016). Decoding the disciplines encourages conscious critical reflection by the teacher/faculty to enable greater learning experiences and accessibility of the curriculum to the students (Miller-Young and Boman, 2017). Decoding the disciplines involves an in-depth process of 7 steps, (Figure 1),

including the decoding interview, to fully understand and then overcome bottlenecks students encounter when accessing the curriculum (Middendorf and Pace, 2004).

Figure 1: Decoding the Disciplines: Seven Steps to Overcome Obstacles to learning (Middendorf and Pace, 2004, page 3)



Threshold concepts

Aiding identification of bottlenecks within the discipline and to delve deeper into transforming and understanding learning is Threshold Concepts (TC) theory. Threshold concepts are concepts which could be deemed to be inaccessible and troublesome but when grasped are akin to a 'portal' of a new way of thinking or transformed way of understanding, the concepts are as such that if the learner does not grasp them their learning will potentially stagnate and not progress (Meyer and Land, 2006). Eight characteristics have been ascribed to threshold concepts – troublesome knowledge, transformation, irreversibility, integration, boundedness, reconstitution, discourse and liminality (Nicola-Richmond et al., 2018b).

Supporting liminality, the transitional 'rite of passage' phase through the acquisition of knowledge and transformational thinking, appears to be a keystone in TC acquisition and the use of varied and diverse teaching and learning opportunities for the students are required (Nicola-Richmond et al., 2018b). Similar to the difficulties found with DtD, the very nature of TC means that once they are crossed the learner is in a transformed state of understanding and as such the tutor/lecturer may have difficulty identifying or recognising TC due to transformation of their own learning long being passed (Gaunt and Loffman, 2018). Considering the phenomenon of neurophobia and the evidence around TC a question could be posed of whether neurophobia indeed an overarching phenomenon or does it in fact consist of several troublesome concepts/bottlenecks?

Playful learning

A recent systematic scoping review of the evidence related to learning styles of physiotherapy students revealed that these students use abstract conceptualisation, synthesise information to solve problems in a systematic and logical manner, and have a preference for active participation and kinaesthetic learning styles (Stander et al., 2019). Playful learning (PL) has long been incorporated into early years and primary education, however it remains a relatively new pedagogical approach in adult learners (Nørgård et al., 2017). Playful learning is an approach which lends itself well to kinaesthetic learners and involves active participation, and as such may be an appropriate tool to use with physiotherapy students (Rice, 2009). It is a pedagogy associated with active engagement enabling learning/experimentation in a risk-free environment (Walsh, 2015, Kangas et al., 2017). It enables in depth learning, particularly when a student is in the 'flow' of the playful learning activity (Walsh, 2015, Kangas et al., 2017).

To effectively implement PL the task should be scaffolded starting with smaller activities with the ability to be successful and then gradually build up difficulty/explore more difficult concepts, in addition PL should also involve immediate feedback (Walsh, 2015). Step three of decoding the disciplines requires the task to be modelled in order to explore difficult concepts, and playful learning in the context of neurophobia could therefore be used as a tool to optimise kinaesthetic and transformational learning whilst allowing a risk-free environment and enable deeper learning. Playful learning, in its nature, enables students to practice skills and get feedback whilst also being motivating, therefore also addressing steps 4, 5 and 6 of the DtD framework.

Aim

This study has two aims, firstly to investigate the use of playful learning activities in the NS2 curriculum to address neurophobia, and secondly to apply the principles of decoding the disciplines to the NS2 2019/20 curriculum and identify threshold concepts to shape future curriculum design.

Using playful learning as a pedagogy in Neurosciences 2

Module feedback from 2018/19 NS2 module identified some key areas of difficulty students came across, these were linking neuroanatomy/neurophysiology to neurological pathologies, and the complexities of the underlying neuroanatomy/neurophysiology knowledge. The curriculum content was re-designed for 2019/20 to minimise subject complexity where possible, inclusion of an additional two-weekly tutorial on linking anatomy to pathophysiology, ensuring tutorials were not mini-lectures and facilitates great student engagement and higher-level learning, and introduction of playful learning into four different sessions. Playful learning was introduced in the frame of encouraging fun in education as detailed by Whitton and Langan (2019), as depicted in Figure 2., and ensured the content was appropriately scaffolded to enable deeper learning and exploration of potential threshold concepts (Walsh, 2015). The playful learning sessions are detailed in Figure 3.

Figure 2: Thematic network for fun in higher education (Whitton and Langan, 2019) page 1005.

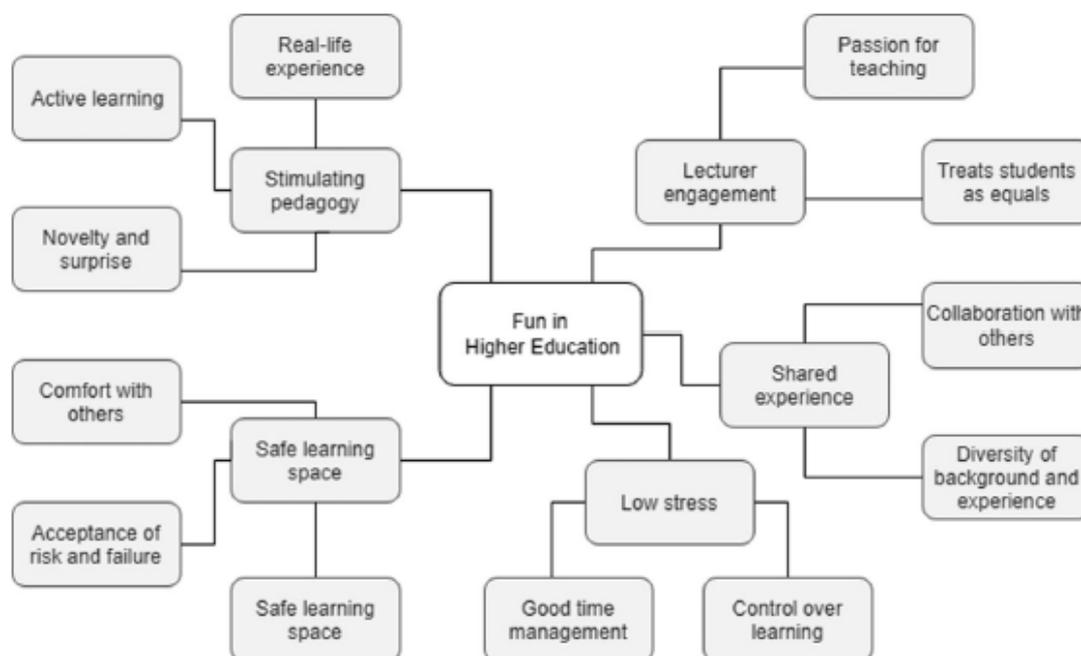


Figure 3: Playful learning pedagogy in NS2 2019/20 curriculum



NS2 Activity: Lecture - Review of neuroanatomy, sensorimotor loop and generation of an action potential

Threshold concept: Transmission of an action potential

Playful learning activities: Whole class wool mexican wave to demonstrate action potential polarisation, selected students across the class to throw a ball along the wool to demonstrate Nodes of Ranvier and impact of myelin, then finally wool cut at the end of the seating rows to represent synapse and then ball-pool balls to be pass to the next row to enable transmission to occur

Scaffolding: Theory for how an action potential transmits taught prior to the activity, video of the neurophysiological process watched after the activity, transmission of an action potential in relation the the rest of the content and functional neuroanatomy reinforced in subsequent lecture content.



NS2 Activity: Tutorial - Introduction to linking anatomy to pathology

Threshold concept: Linking theory to practice, abstract conceptualisation and synthesis of information

Playful learning activities: Rapi-neuro-doh - groups using playdoh to model neuroanatomy. How do you learn - students working in groups to conceptualise how an action potential could be described in the context of a postal system, computer system, electricity system, transport system.

Scaffolding: Explanation of purpose of linking anatomy to pathology tutorials in the future linking anatomy to pathology tutorials prior to PL activities, then following activities students had to explain as a group how action potentials travel in specific pathways, and how they are disrupted in disease. These activities helped to prepare the students for future group student-led linking anatomy to pathology tutorials.



NS2 Activity: Tutorial - Linking anatomy to pathology: The basal ganglia - direct and indirect pathways

Threshold concept: Linking theory to practice, abstract conceptualisation and synthesis of information. Complex neuroanatomy/neurophysiology knowledge

Playful learning activities: Students provided with laminated 'white-boards', basal ganglia puzzle pieces, and white-board markers, advised to use however suits their learning style throughout the tutorial, and they could document their work by taking pictures on their mobile phones

Scaffolding: Students were able to actively participate in a kinesthetic way with the puzzle to suit their way of synthesising/conceptualising the basal ganglia and their pathways throughout the taught components of the tutorial



NS2 Activity: Tutorial - Linking anatomy to pathology - Duchenne Muscular Dystrophy (DMD), dystrophin and genetics

Threshold concept: Linking theory to practice, abstract conceptualisation and synthesis of information

Playful learning activities: Making muscles out of strawberry laces (red liquorice) and cling film, genetics puzzle - dystrophin coding

Scaffolding: Structural and functional muscle anatomy taught prior to creating muscle models, function and structure of dystrophin prior to dystrophin genetics puzzle, puzzle used to highlight genetic abnormalities, muscle model cling film then torn to replicate pathophysiology of DMD

The impact of playful learning was investigated via use of the module feedback questionnaire via a Canvas quiz using an open question of '*How did you find the playful learning activities?*'

The playful learning approach was implemented in the NS2 2019/20 curriculum prior to the module lead's knowledge of the DtD and TC theories. Therefore, following the culmination of the NS2 module in November 2019 student feedback was sought regarding open questions about what students found difficult and what students found interesting to aid bottleneck and TC identification. This was also collected via a module feedback questionnaire Canvas quiz.

Results

Playful Learning

All students enrolled in NS2 (n=49) were invited to participate in the module feedback questionnaire Canvas quiz, 16 students completed the questionnaire, with 14 students completing the three qualitative questions regarding playful learning and DtD. Results from this questionnaire can be seen in Appendix 1. Overall, the students who responded to the questionnaire appeared to have found the playful learning activities useful in aiding their learning. Three students (7, 10, 12) appear to have mis-understood the term playful learning and instead appear to refer to the use of play as an assessment and treatment technique taught in practical classes in paediatrics (Duchenne Muscular Dystrophy). Students commented that playful learning aided their understanding, helped to put theory into practice and enabled information to be retained as it was more memorable. Students found the playful learning activities engaging and a fun way to learn.

Threshold Concepts

As anticipated students identified linking anatomy to pathology/pathophysiology as the most troublesome concept, followed by understanding pathophysiological processes. Further bottlenecks related to disciplinary mastery and their transformational clinical understanding as physiotherapy professionals, this theme related to the troublesome topics of clinical reasoning, creating problem lists, using the International Classification of Functioning model and goal setting. Students also remarked upon the curriculum being overloaded.

What students found interesting

In addition to what students found difficult they were also asked about what they found interesting. Students found learning about the different pathologies interesting. Six students commented upon the patient visits as being integral and transformational in consolidating and applying their newly learnt knowledge. Two students (3 and 4) in their comments could be perceived to have traversed a liminal space:

Student 3:

“Every patient with a neurological condition can present differently and therefore also have different treatment strategies, emphasising the individuality of each patient”

Student 4:

“I found learning about all 3 conditions very interesting, particularly when it came to learning how a dysfunction in the brain (large or small) affects the physiology of the body.”

Discussion

The observed threshold concepts highlighted by NS2 students align with that of medical and physiotherapy students and thus could be grouped under the heading of ‘neurophobia’. The NS2 students did not exhibit fear in their responses, however, it is important to note that the questions asked in the module feedback questionnaire were not targeting neurophobia directly and were more exploratory in nature regarding DtD and TC. Therefore, in UH level 5 physiotherapy students rather than neurophobia being an experiential phenomenon, it appears to be an overarching term for several troublesome threshold concepts or bottlenecks. The NS2 troublesome concepts related to neurophobia were regarding difficulty conceptualising neurosciences knowledge, linking theory to practice and clinical reasoning (Ridsdale et al., 2007, Walker, 2013).

The tension between relating theory to practice, phronesis, is well documented in healthcare and other practical sciences; it is often noted as the disconnect between the classroom and ‘real world’ exposure, and as such healthcare students may not yet have had the practical context to enable liminal learning to occur (Yeo, 2017). Hermeneutic ‘real world’ consciousness is required to provide provisionality and context to the theoretical content (Yeo, 2017). This appears to be true of the experiences of the level 5 physiotherapy students who stated that patient visits aided their learning, thereby fostering a greater hermeneutic consciousness. This emphasises the importance of clinical placement modules in professional degrees because until students have been emerged in the ‘real-world’ experience of working with people with neurological dysfunction it can be difficult to move through this liminal space and make true links between theory and practice.

It has also been argued that this liminal learning space may continue past graduation and true transformation in relation to these TCs may only occur once qualified working in the field itself (Nicola-Richmond et al., 2018a). This demonstrates a necessity of practice-based and life-long learning to truly overcome TCs in professional programmes (Nicola-Richmond et al., 2018a). It also poses the question of whether it is realistic or not to expect the students to achieve a post-liminal state regarding these TC in their undergraduate education. One way to address this would be to make TCs more transparent to the students

from the outset, this may aid student learning and potentially reduce perceived neurophobia. Troublesome concepts/knowledge benefit students on their apprenticeship to becoming experts/professionals, they are a part of lifelong learning and professional development, and it is expected that once qualified they will continue come across further troublesome concepts in their professional lives. Therefore, re-framing such concepts to be part of the student's learning journey may foster greater student self-efficacy and develop confident curious learners (Neve et al., 2016, Gaunt and Loffman, 2018).

TC have been explored in undergraduate physiotherapy practice through use of concept mapping in supporting students to make links between theory and practice in neurological physiotherapy (Barradell et al., 2018). Barradell et al., (2018) highlighted the importance of conceptual challenge in working towards disciplinary mastery, links between concepts are important to integrate knowledge of the discipline and in practice. Therefore, using concept mapping may be a useful tool in helping NS2 students achieve a liminal state regarding conceptualising neurosciences knowledge, linking theory to practice and clinical reasoning. However, it would be recommended that this approach be used towards the end of the module due to involving synthesis of multiple concepts.

Looking to the literature a DtD exercise was undertaken with athletic therapy students, this study highlighted similar difficulties in athletic therapy students as those faced by NS2 students in understanding anatomical theory and linking this to clinical presentation and practical application (Yeo et al., 2017). Yeo et al., (2017) for these students recommended a kinaesthetic and active engagement approach of learning through drawing. In neurosciences we cannot see, feel or touch the nervous system nor see the pathological processes of neurological disease, and as such learners are required to imagine or visualise this system (Holley, 2018). Although a DtD interview has not been conducted for NS2 as yet, the module lead for NS2, and therefore perceived 'expert', visualises the nervous system to understand and phronetically link these complex issues. Use of drawing as a tool for learning anatomical knowledge has been found to increase knowledge retention in medical and biomedical students, therefore NS2 physiotherapy students may also find this useful regarding improving visualisation of the nervous system (Balemans et al., 2016).

Prior to exploring neurophobia through the lens of DtD and TC, playful learning was introduced into the NS2 curriculum to address the anecdotally observed neurophobia. Module evaluation has identified that a small sample of level 5 students found it useful as a fun and engaging pedagogical tool to explore complex troublesome NS2 topics. Rigorous investigation of playful learning as a transformational learning tool for TC in NS2 has not been explored in this study and should be the focus of future work, however, it has demonstrated promise in the act of modelling and practicing TC activities and can motivate by enhancing the learning environment. From a teaching perspective, use of a structured 'scaffolding' approach to PL ensured that the PL tasks were embedded into the teaching

sessions in a way that built upon foundational knowledge and consolidated or explored troublesome concepts in an active, fun and engaging way.

It is important to be mindful that the module feedback equates to 25% of the students enrolled on the NS2 module, and therefore although promising it would be appropriate to suggest that those who responded to the questionnaire were potentially more engaged in the module and therefore the results may be biased in favour of this. The playful learning approach therefore may not be suitable for some students. A critique of the TC theory is that TC are often viewed as a cohort wide difficulty, and in many cases this may be true, however, individual students may perceive these differently, they may be at different places on their liminal, phronetic and hermeneutic journey and as such the approach to addressing TC needs to be varied (Nicola-Richmond et al., 2018b). Therefore, PL may just be one piece of the toolkit to address neurophobia related TC.

Having identified some key threshold concepts the next step in the DtD approach would be to understand how an expert would approach these and work through the liminal stages of TC acquisition (Nicola-Richmond et al., 2018b). This would require undertaking an in-depth expert DtD interview, unfortunately this is outside the scope of this article, however, it is proposed as the next stage of work in evaluating and re-designing the NS2 curriculum. When conducting the DtD interview it is recommended to employ a hermeneutic approach to the ways of seeing, knowing and practicing when exploring these TC (Yeo, 2017). It is also advocated that in physiotherapy education we should be using TC and ways of thinking and practicing to help shape mindful curriculum development, to shift the perspective away from content driving to process and improving the student learning experience (Barradell, 2017).

This article has identified potential threshold concepts as a first line of inquiry into how to decode the NS2 curriculum and address neurophobia in a more rigorous fashion. However, as suggested by the literature, the next step in this process would be to investigate the experience of threshold crossing and to identify whether the recommendations suggested lead to a reduction in neurophobia by measuring the mastery of such TCs (Nicola-Richmond et al., 2018b). It is recommended that the first line of inquiry will be an in-depth DtD interview with the module lead and module team, furthermore a focus group with previous students regarding TC in NS2 may also be beneficial. It is recommended that to aid the process of mastering these TC may to use an eclectic pedagogical approach is required which may involve use of such tools as playful learning, concept maps, drawing, visualisation and adopting a systems approach

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Appendix 1: Results from the NS2 2019/20 Module Feedback Questionnaire

Student	<p>How did you find the playful learning activities? Please comment on whether you found them useful/not useful and why, plus any other feedback you have about these activities:</p>	<p>What did you find interesting on this module?</p>	<p>What did you find difficult on this module?</p>
1	<p>I found them useful and relevant. Really helped to understand certain topics.</p> <p>Lastly, the whiteboard idea and laminated cards was really thoughtful and a good idea - helped to understand the info in that class.</p>	<p>It was interesting to learn about all 3 conditions as a whole and getting the chance to be visited by patients who have the condition was also interesting.</p>	<p>There was a lot of information to digest in this module. In a week I felt overwhelmed with the amount of information, then it would be hard to stay on top of the workload with independent study as new information would follow.</p> <p>It was also sometimes difficult to work in our allocated smaller groups for the whole module.</p>
2	<p>I found them very useful as I feel it put theory into practice in a practical logical way and brought things back to basics therefore building a good foundation of knowledge to build upon</p>	<p>The patient visits. It showed the reality of each condition and made it easier to think of application of skills and knowledge.</p>	<p>Some of the group tasks with different opinions etc.</p>
3	<p>Learning by play is very effective and allows the information being taught to be retained. Because it is different, it becomes more memorable</p>	<p>Every patient with a neurological condition can present differently and therefore also have different treatment strategies, emphasising the individuality of each patient</p>	<p>Remembering the pathology and pathophysiology of each condition</p>
4	<p>I found the playful learning activities useful to some extent, perhaps more so in the understanding of the content and less so in remembering the content.</p>	<p>I found learning about all 3 conditions very interesting, particularly when it came to learning how a dysfunction in the brain (large or small) affects the physiology of the body.</p>	<p>I found setting GAS goals somewhat difficult, for all stages.</p>

5	Activities in practical sessions have been very useful and helpful throughout NS2.	I found the different pathologies very interesting and enjoyed learning about these in detail.	I found the sessions on problem listing hard - I feel these tutorials were useful but one session each stage of disease was tedious especially as what tutors classified as 'primary, secondary, tertiary' varied slightly so it was hard to understand if we were along the right track. This also includes the ICF model - sometimes these were asked to be filled out differently so I may have understood one session and then confused the next?
6	The playful activities were useful as we were able to adapt	The 3 different pathologies. The patient visits were very helpful. They pulled all the learning together.	The pathologies were difficult to grasp in detail as quite often the lectures would have an information overload especially with everything else we had on in a day. Often the slides would contain too much information to process.
7	It was useful to be able to play and try and think of different ways to treat, but I would have found it more helpful to have been given a problem that the patient may have presented with and to link the play to that problem	Patient visits were really helpful to gain an insight into what it's like to live with the given pathologies. I preferred when we were in smaller groups as it felt more like a discussion than a presentation, and I felt more at ease to ask the patient and their family questions	I found the linking pathology to anatomy challenging, particularly having to present back to the class. I feel that maybe this tutorial should be in the week after the introduction to the pathology, this may have helped me as i would have had time to read up on it
8	I'm a hands on learner. So carrying out the activities really helped put treatment ideas in perspective!	How exercise maintains and increases the time of the neurological conditions worsening. I really enjoyed this module!	Linking neuroanatomy to clinical symptoms and conditions
9	Useful: able to put what we've been taught into practice	Parkinson's section and cognitive behaviour patterns	Theory behind MS

10	<p>It was a fun session and way to learn.</p> <p>However would be nice to have example ideas of ideas used by the lecturers in the real world rather than just our imagination (which is harder for some with non-imaginative brains) and whether they would be effective</p>	<p>The pathophysiology of each of the conditions were interesting. However, when writing up notes later in the week I found the pathophysiology was spread over a few lectures with different things to add each time as lecturers take were not all on same page</p>	<p>Group tasks of linking anatomy to pathology. We're never shown an example in how to go about task or ways to get your head around it.</p> <p>Would then be nice to have an example/right or wrong answers post completion of table as i do not know if my table is correct</p>
11	<p>They were useful, however I didn't always feel like I was fully paying attention/engaging and therefore not getting the most out of it / fully understanding due to the lateness of the Practical session sometimes on the backend of an already busy day</p>	<p>Learning about the conditions.</p>	<p>Pathophysiology of S &S & knowing which S & S it is required of us to learn the pathophys of.</p>
12	<p>So much fun!</p> <p>Really gave us chance to get into practice of making physio fun and engaging for children!</p> <p>Wish we could have more practicals involving play as they make the practical and knowledge memorable</p>	<p>The different varieties of diseases we will be treating as physios.</p> <p>The patient visits were a great asset to the module - however may be more useful to be timetables for the 2nd week of teaching when we have more of an understanding of the disorder</p>	<p>Linking anatomy to pathology however the extra tutorial and supported learning helped with the difficult biology behind the disease</p>
13	<p>Very useful</p>	<p>Practical aspect</p>	<p>Quick pathophysiology run through of conditions</p>
14	<p>I found them quite useful because they were very engaging</p>	<p>DMD generally</p>	<p>MS and PD and linking anatomy to pathology</p>